POLARIMETRIC RADAR PROCESSING OF AIRSAR IMAGERY FROM LOS ANGELES BASIN REGION

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by
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The undersigned, appointed by the Dean of the Graduate School, have examined the thesis entitled

POLARIMETRIC RADAR PROCESSING OF AIRSAR IMAGERY FROM LOS ANGELES BASIN REGION

presented by Andrew T. Hedrick, a candidate for the degree of Master of Science, Electrical Engineering, and hereby certify that, in their opinion, it is worthy of acceptance.

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ACADEMIC ABSTRACT

Extracting useful information and intelligence from polarimetric interferometric synthetic aperture radar (PolInSAR) data involves a variety of highly sophisticated processing methods. To aid in the advancement of efficient PolInSAR processing techniques, an investigation of underlying scattering mechanisms such as coherent scatterers (CS) and polarimetric decomposition techniques is conducted in this study using JPL AIRSAR fully polarimetric data over a portion of the greater Los Angeles area.

For this study, selection of the overall optimum polarization showed an increase of CS candidates compared to standard polarizations. In addition, polarimetric decomposition (α-*H* and *F*/*D*) analysis of CS and non-CS (NCS) pixels found a trend of increasing double-bounce scattering, *Fd*, with decreasing volume scattering, *Fv*, and polarimetric Entropy, *H*, for CS relative to NCS.

Chapter 1: Introduction

Extracting useful information and intelligence from polarimetric interferometric synthetic aperture radar (PolInSAR) data involves a variety of highly sophisticated processing methods. Using these advanced techniques, PolInSAR data can provide multiple useful outputs such as ground cover suppression, occluded target detection, target scattering characteristics, and land cover. To aid in the advancement of efficient PolInSAR processing techniques, an investigation of underlying scattering mechanisms such as coherent scatterers (CS) and polarimetric decomposition techniques is conducted in this study using AIRSAR fully polarimetric data over a portion of the greater Los Angeles area.

1.1 Remote Sensing

The field of remote sensing focuses largely on measuring data from distant observation points [Jensen, 2007]. Although remote sensing has been going on for more than 150 years from the first photographic platforms installed on tethered balloons, developments in the last 50 years have led us beyond the capabilities of these platforms.

Satellite-based systems allow us to capture data about the earth from orbit from a consistent and repeatable viewpoint [Schowengerdt, 1997].

These systems' consistency and wide array of sensors have fueled an explosion in applications. Platforms now exist that can measure atmospheric phenomenon such as composition, pressure, and temperature, surface topology, land use, and surface change detection [Elachi and van Zyl, 2006].

Advancements in use and study of active sensors, specifically study of Synthetic Aperture Radar Polarimetry (PolSAR), promise further improvements in scene characterization, land use, geologic surveying and change, and full understanding of targets of all kinds [Boerner, 2005].

1.2 RADAR

RAdio Detection And Ranging (RADAR) has become common enough that it went from an acronym to the English noun radar. Its beginnings can be traced back to Hertz and Tesla, who both demonstrated phenomenon of reflecting radio waves and using them for detection [Richards, 2005].

The "radio" in radar makes it different from optical detection techniques, which use visible light. Figure 1-1 illustrates the entire electromagnetic spectrum, which includes visible light that the human eye interprets as well as Gamma rays, X-rays, infrared, and radio waves. Radar commonly uses a slice of the spectrum from 3 MHz to 300 GHz, or wavelengths of 100 m to 1 mm.

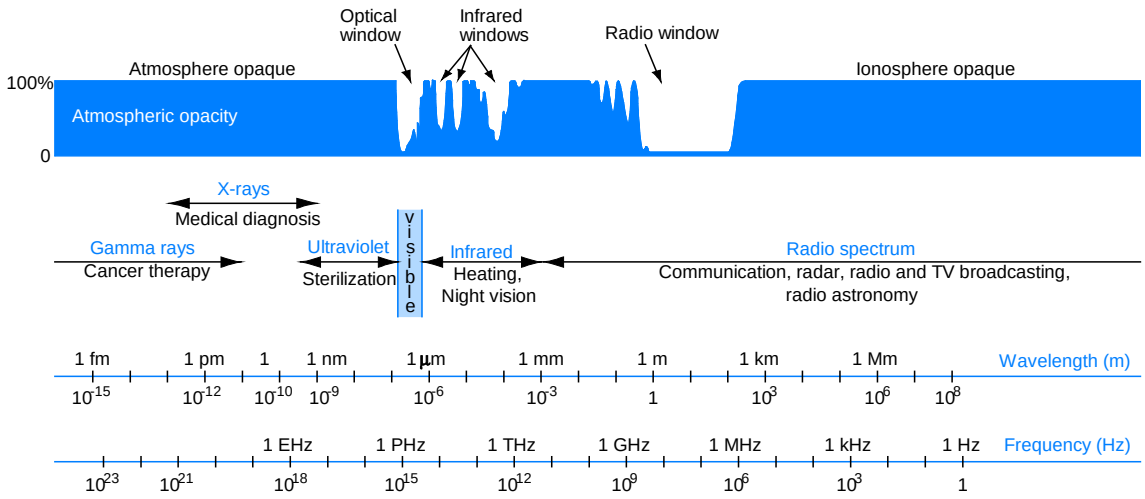


Figure 1-1. The Electromagnetic Spectrum [*Ulaby*, 2004].

Table 1-1. Common Radar Frequency Bands [Richards, 2005].

Band	*Frequencies* (f)	*Wavelengths* (λ)
HF	3–30 MHz	100–10 m
VHF	30–300 MHz	10–1 m
UHF	300 MHz–1 GHz	1–30 cm
L	1–2 GHz	30–15 cm
S	2–4 GHz	15–7.5 cm
C	4–8 GHz	7.5–3.75 cm
X	8–12 GHz	3.75–2.5 cm
Ku	12–18 GHz	2.5–1.67 cm
K	18–27 GHz	1.67–1.11 cm
Ka	27–40 GHz	1.11 cm–7.5 cm
mm	40–300 GHz	7.5–1 mm

While sensors have been made to detect electromagnetic waves from any portion of the spectrum, radar has several advantages over other techniques for object detection and remote sensing.

1.2.1 Active and Passive Remote Sensing

Remote sensing platforms have sensors which can be broken down into two categories: passive and active.

Passive sensors are those which measure and record reflected or emitted electromagnetic energy such as visible, near-infrared, and thermal infrared light. One of the main drawbacks is imaging sensitivity to conditions such as time of day and weather.

Active sensors, on the other hand, generate their own electromagnetic energy and measure it. Because of this, many can image at night when the sun's radiation is no longer prevalent. A sampling of common radar frequencies is shown in Table 1-1. Some advantages of radar remote sensing include the ability to penetrate clouds and even the surface of sand, snow, and vegetative cover [Jensen, 2007].

1.2.2 Synthetic Aperture Radar

An advancement made possible by radar signal processing is Synthetic Aperture Radar (SAR). This high-resolution imaging technique is useful when the imaging source is moving and the ground scene is static [Richards, 2005]. This makes it well suited for satellite or airborne remote sensing of the earth.

SAR synthesizes an aperture larger than the physical size of the antenna by combining multiple measurements taken over the larger synthetic length (e.g. stripmap SAR see Figure 1-2). Typically, this creates high cross-range (or azimuth) resolution.

High resolution in the direction of radar energy ("down range" in the Figure) is attained with increased bandwidth.

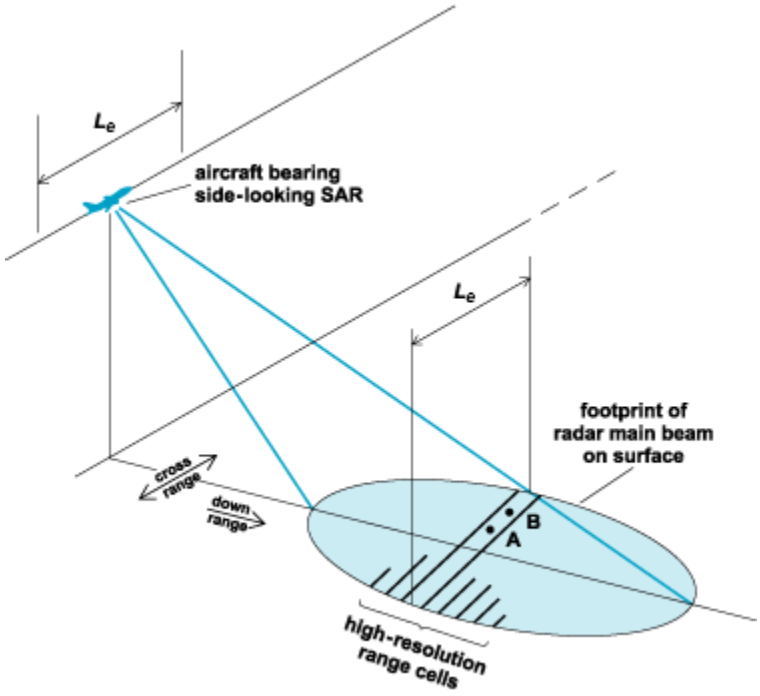


Figure 1-2. Synthetic Aperture Radar Track [Image Courtesy The University of Edinburgh].

1.2.3 Scatterers

In SAR, scatterers refer to surfaces and objects which reflect some of the transmitted radar signal back to the receiver. Radar scatterers reradiate a portion of an incoming wave in multiple directions and ratios, and the amount reflected back will determine how it is detected by the radar. Radar scattering from a surface is very strongly affected by surface geometry, both large-scale (shape) and small (roughness) [Elachi and van Zyl, 2006]. An object's scattering phenomenon is characterized by its scattering matrix [Giuli, 1986] which can be implemented with an orthogonal linear polarization basis [Boerner *et al.*, 1991].

For enhancing PolInSAR techniques to measure deformation, this project strives to identify strategies and approaches for detecting CS candidates for InSAR point target analysis (IPTA) of fully polarimetric SAR data. IPTA analysis is more accurate and efficient with a higher quality list of CS candidates. Fully polarimetric data permit a more direct assessment of the scattering properties. Hence, we assess the improvement in detection of CS candidates using polarimetric criteria. Los Angeles (LA) site with fully polarimetric data was selected from the JPL AIRSAR public website. The LA site has various urban and other cover types for spatial CS studies. From open literature, polarimetric processing methodologies are applied to the test site data. For efficient CS processing, detection, and analysis, the primary processing control parameters were studied.

1.3 Thesis Organization

The organization of remaining portion of this thesis is described. Chapter 2 presents the area of study in detail, as well as the data and conventions used for the rest of the study. The area of study is broken into smaller characteristic sections to facilitate classification and data processing. Chapter 3 describes the methodologies used for the polarimetric SAR processing. Chapter 4 presents a discussion and summary of this study results and findings. Chapter 5 outlines further research that can be performed on polarimetric algorithms. Reference sections list the full citations of the literature cited. Appendices detail various information and tables of processed data outputs.

Chapter 2: Polarimetric AIRSAR Imagery of Los Angeles

2.1 Area of Study

The area selected for this study was a section of the Los Angeles (LA) basin in the state of California, highlighted in Figure 2-1. This urban area includes various commercial and residential areas as well a number of other areas interspersed.

Figure 2-1. The area of study was near the city of Los Angeles.

An image of the LA area of study scene was collected by NASA Jet Propulsion Laboratory's Airborne SAR (AIRSAR) on April 29, 1998 with a data collect number of "cm5439". AIRSAR missions were flown on a JPL DC-8 Aircraft. Typically, AIRSAR in its fully polarimetric mode collects data from three frequency bands: P, L, and C. For this study, C-band AIRSAR data were used. For the LA study area, the radar bandwidth was 20 MHz centered about the C-band frequency of 5.3 GHz [NASA JPL, 2003; NASA JPL, 2008].

Publicly archived AIRSAR data of the study site were acquired from the Alaska Satellite Facility. The scene studied is a subset of the entire cm5439 image. This subset is from 34°11′06″ to 33° 59′30″ latitude north and between 118° 20′40″ and 118° 17′54″ longitude west. This is a distance of about 21.5 km long and 4.3 km wide in ground range. For the study image, the size in slant range is 2560 pixels spaced at 6.66 m by 600 pixels spaced at 9.26 m [NASA JPL, 2003]. This AIRSAR data is stored in a JPL-custom compressed Stokes matrix format. The decompression algorithm is detailed in the literature [NASA JPL, 2008] and summarized below. The following equations relate the uncompressed Stokes matrix **M** to the Sinclair scattering matrix **S** [NASA JPL, 2008]:

$$M_{11} = \tfrac{1}{4}[S_{hh} \cdot S_{hh}^* + S_{vv} \cdot S_{vv}^* + 2S_{hv} \cdot S_{hv}^*] \quad (2\text{-}1)$$

$$M_{12} = \tfrac{1}{4}[S_{hh} \cdot S_{hh}^* - S_{vv} \cdot S_{vv}^*] \quad (2\text{-}2)$$

$$M_{13} = \tfrac{1}{2}\mathbb{R}[S_{hh} \cdot S_{hv}^*] + \tfrac{1}{2}\mathbb{R}[S_{hv} \cdot S_{vv}^*] \quad (2\text{-}3)$$

$$M_{14} = -\tfrac{1}{2}\mathbb{I}[S_{hh} \cdot S_{hv}^*] - \tfrac{1}{2}\mathbb{I}[S_{hv} \cdot S_{vv}^*] \quad (2\text{-}4)$$

$$M_{22} = \tfrac{1}{4}[S_{hh} \cdot S_{hh}^* + S_{vv} \cdot S_{vv}^* - 2S_{hv} \cdot S_{hv}^*] \quad (2\text{-}5)$$

$$M_{23} = \tfrac{1}{2}\mathbb{R}[S_{hh} \cdot S_{hv}^*] - \tfrac{1}{2}\mathbb{R}[S_{hv} \cdot S_{vv}^*] \quad (2\text{-}6)$$

$$M_{24} = -\tfrac{1}{2}\mathbb{I}[S_{hh} \cdot S_{hv}^*] + \tfrac{1}{2}\mathbb{I}[S_{hv} \cdot S_{vv}^*] \quad (2\text{-}7)$$

$$M_{33} = \tfrac{1}{2}S_{hv} \cdot S_{hv}^* + \tfrac{1}{2}\mathbb{R}[S_{hh} \cdot S_{vv}^*] \quad (2\text{-}8)$$

$$M_{34} = -\frac{1}{2}\mathbb{I}[S_{hh} \cdot S_{hv}^*] \quad \text{2-9}$$

$$M_{44} = \frac{1}{2}S_{hv} \cdot S_{hv}^* - \frac{1}{2}\mathbb{R}[S_{hh} \cdot S_{vv}^*] \quad \text{2-10}$$

where $\Re[\cdot]$ and $\Im[\cdot]$ represent the real and imaginary part of the quantities, respectively. The other 6 elements of the 4x4 matrix are filled in as **M** is symmetric. From symmetry [Boerner *et al.*, 1991] and $M_{11} = M_{22} + M_{33} + M_{44}$, the 16 elements may be represented by 9 independent elements. It should be noted that all elements of **M** are real.

The AIRSAR data in compressed Stokes format contains 10 bytes per sample. M_{11} is normalized by a total power factor that is stored in the first byte. The remaining elements are then all normalized to M_{11}.

$$M_{11} = \left(\frac{byte\ (2)}{254} + 1.5\right) \times 2^{byte\ (1)} \times gen\_fac \quad \text{2-11}$$

$$M_{12} = byte(3) \times \frac{M_{11}}{127} \quad \text{2-12}$$

$$M_{13} = sign(byte(4) \times \left(\frac{byte\ (4)}{127}\right)^2 \times M_{11} \quad \text{2-13}$$

$$M_{14} = sign(byte(5) \times \left(\frac{byte\ (5)}{127}\right)^2 \times M_{11} \quad \text{2-14}$$

$$M_{23} = sign(byte(6) \times \left(\frac{byte\ (6)}{127}\right)^2 \times M_{11} \quad \text{2-15}$$

$$M_{24} = sign(byte(7) \times \left(\frac{byte\ (7)}{127}\right)^2 \times M_{11} \quad \text{2-16}$$

$$M_{33} = byte(8) \times \frac{M_{11}}{127} \quad \text{2-17}$$

$$M_{34} = byte(9) \times \frac{M_{11}}{127} \quad \text{2-18}$$

$$M_{44} = byte(10) \times \frac{M_{11}}{127} \quad \text{2-19}$$

$$M_{22} = M_{11} - M_{33} - M_{44} \quad \text{2-20}$$

where *byte*(*n*) refers to the *n*th byte of the sample, sign(·) is the ± sign of the quantity, and *gen_fac* refers to the linear scale factor from the header information [NASA JPL, 2008].

After decompression the data are also stored in a full Sinclair scattering matrix for interpretation [Zebker and van Zyl, 1991; Chu, 2003]. An intuitive way to view the information is by representing the independent Sinclair matrix elements S_{hh}, S_{hv}, and S_{vv} for each sample in separate images, ordered in a two-dimensional range-azimuth space. Phase information is relative phase. To synthesize spatially random phase, each pixel location was multiplied by the same phase to maintain relative phase relationship phase by

$$\varphi_{rnd} = e^{(j2\pi)*rand\ ()} \qquad 2\text{-}21$$

where rand() returns a number selected from the uniform interval [0,1]. Figure 2-2 shows the three polarimetric bands of the AIRSAR system together in this fashion, shown so that near-range is the top of the image while far-range is the bottom. This corresponds to roughly the North-South direction. Compare this SAR image to Figure 2-3, which is a Google Earth visible-spectrum image of the same area. Areas such as the Hollywood hills, lakes, highways and streets, and the golf course can be easily seen.

2.2 Data Chips

In order to facilitate processing and provide a sample set that is based around a land-class theme, several data chips are employed in this study. Figure 2-4 shows the spatial relationship of the chips to the rest of the area. The Master portion refers to the entire imaging mission cm5439. The cropped area is what is referred to as the "scene" in this text as shown in Figure 2-2. The chips are further divisions of the cropped area. The chips are approximately a 1 km x 1 km area on the ground and comprise anywhere from 8000-15000 resolution elements.

Table 2-1 lists the locations of the chips and Figure 2-5 represents this visually.

The chips are noted for noticeable significant land types present, such as residential, golf course, mountain, or water feature. The crop-local reference system refers to pixel numbers relative to the crop in Table 2-1. For this information in a coordinate reference system that based on the whole mission (Master image), refer to Appendix D. The data chips 1 through 20 are shown in Figure 2-6 through Figure 2-25, respectively. These are total power images depicting the total power present in all polarimetric channels. For a look at power for each of the received polarimetric channels, refer to Appendix A.

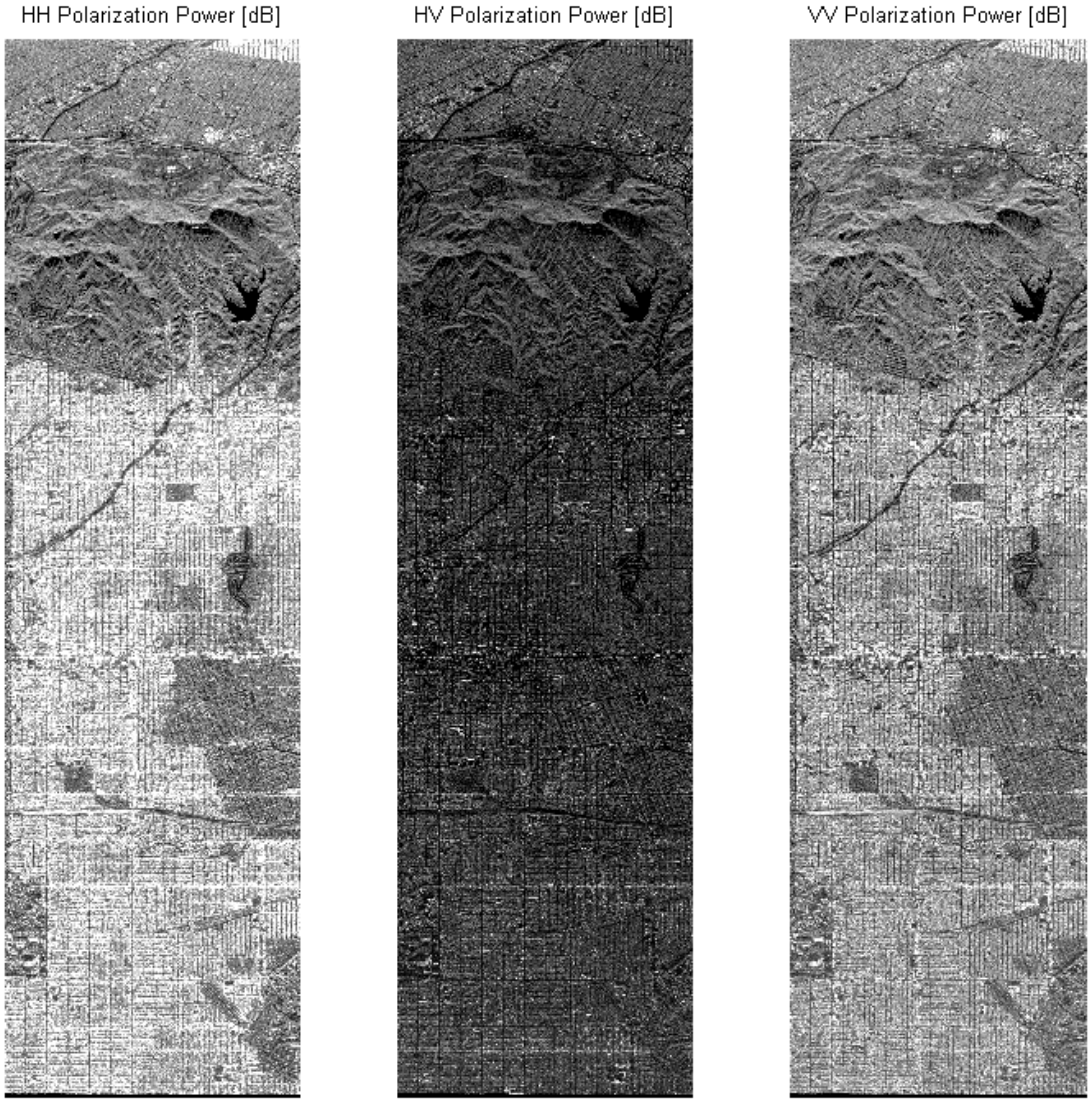


Figure 2-2. Power Intensity Images for each of the Polarimetric Bands in the Area of Study. North is roughly up, East is horizontal to the left. The downrange direction is to the bottom. All three are shown on the same intensity scale, from 7 (white) to -18 dB (black).

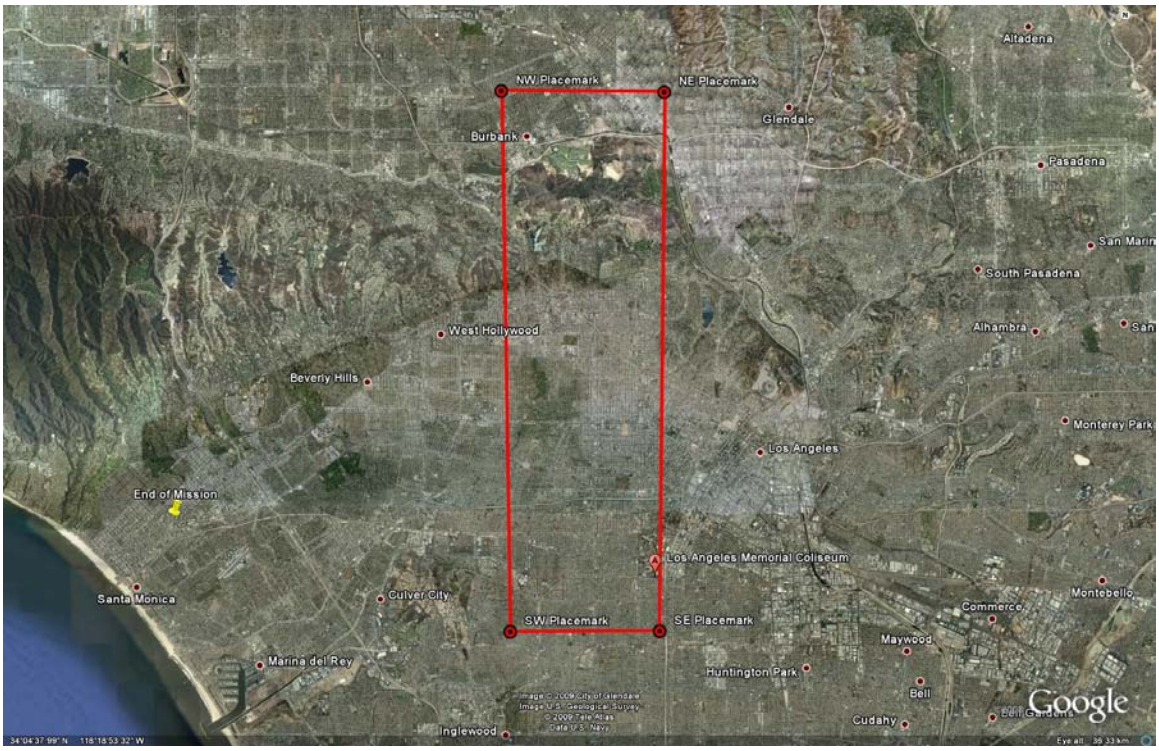


Figure 2-3 Overview of Area of Interest. The portion of the SAR image scene used for this study is outlined in red. North is up and the East is to the right. Image Courtesy of Google.

Figure 2-4. Spatial Relationship of Areas of Mission.

Table 2-1. Coordinates of scene cm5439. A) Master. B) Crop. C) Chip.

A)

	Master Coordinates of Scene						
	Upper Left Corner		*Lower Right Corner*		*Mscene*	*Nscene*	
Scene	Row Pixel	Column Pixel	Row Pixel	Column Pixel	Row Pixels	Column Pixels	**Notes**
CM5439	1	1	2560	6528	2560	6528	LA Metro Region, AIRSAR

B)

	Local Coordinates of Cropped Scene						
	Upper Left Corner		*Lower Right Corner*		*Mcrop*	*Ncrop*	
Scene	Row Pixel	Column Pixel	Row Pixel	Column Pixel	Row Pixels	Column Pixels	**Notes**
CM5439	1	1	2560	600	2560	600	LA Redline Area, Crop

C)

	Local Coordinates of Chip						
	Upper Left Corner		*Lower Right Corner*		*Mchip*	*Nchip*	
Chip	Row Pixel	Column Pixel	Row Pixel	Column Pixel	Row Pixels	Column Pixels	**Notes**
1	1223	442	1355	549	133	108	Golf Course
2	1530	430	1666	537	137	108	Oblique Residential
3	486	202	598	309	113	108	Dense Mountain Peaks
4	1029	308	1158	415	130	108	Hollywood Forever Memorial Park
5	2154	1	2294	108	141	108	Los Angeles Memorial Coliseum
6	1723	101	1861	208	139	108	Rosedale Cemetery
7	1274	137	1407	244	134	108	High Density Residential
8	577	440	694	547	118	108	Lake
9	110	401	191	508	82	108	Near-Range Residential
10	358	376	463	483	106	108	Dense Mountain Peaks
11	56	56	127	163	72	108	Near-Range Residential
12	785	401	908	508	124	108	Residential + Mountain Base
13	470	30	582	137	113	108	Dense Mountain
14	654	75	773	182	120	108	Mountain
15	1029	168	1158	275	130	108	Highway 101
16	1528	108	1664	215	137	108	High Density Residential
17	1721	468	1859	575	139	108	Oblique Residential
18	1978	208	2117	315	140	108	Residential (square)
19	2303	443	2444	550	142	108	Residential with cul-de-sacs
20	2319	126	2460	233	142	108	High Density Residential

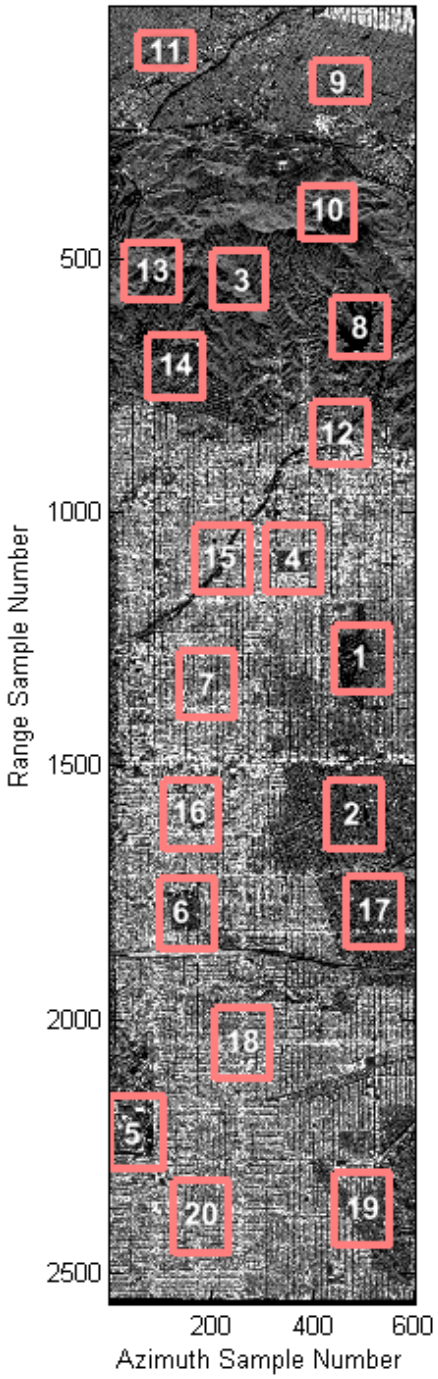


Figure 2-5. The data chip annotations overlaid on a total power image of the scene.

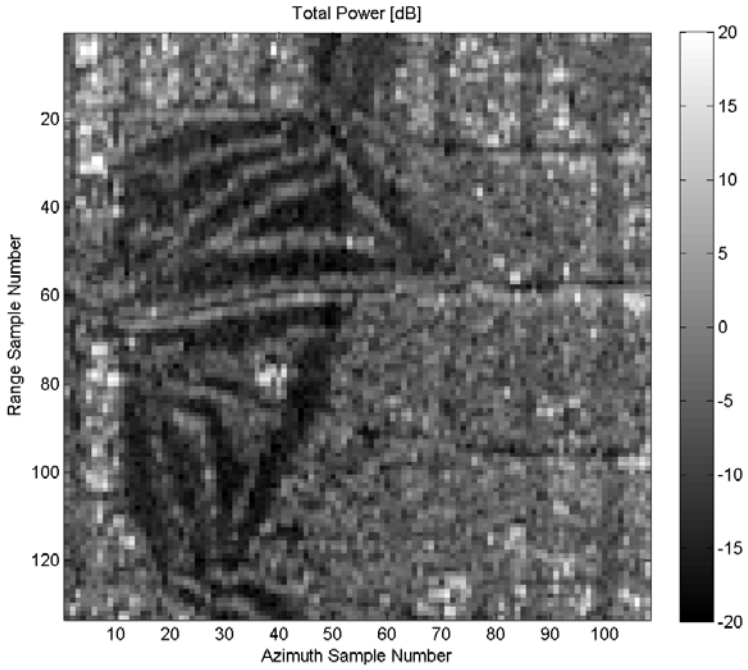


Figure 2-6. Chip 1: Golf Course.

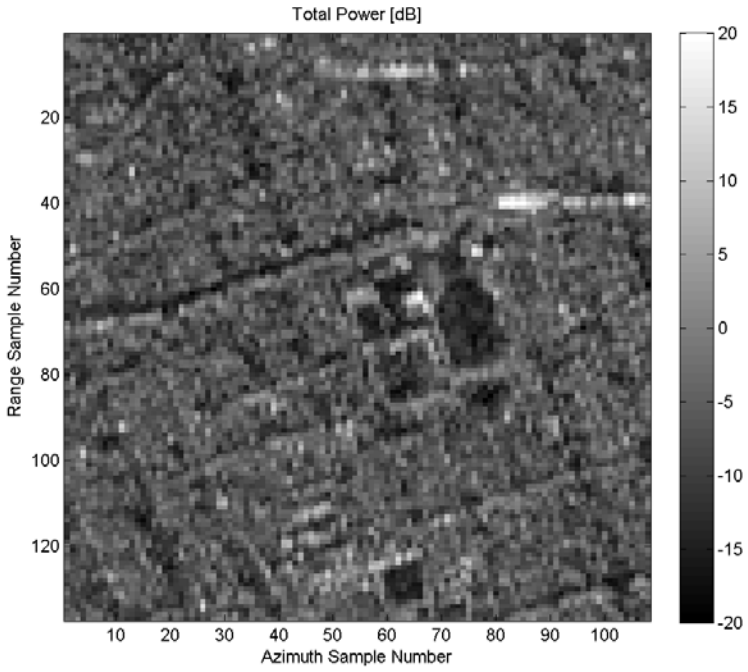


Figure 2-7. Chip 2: Oblique Residential.

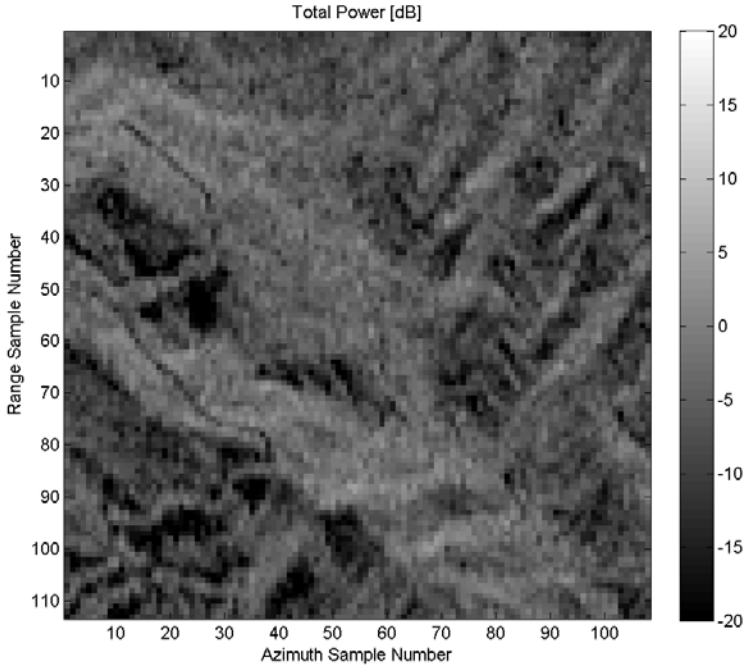


Figure 2-8. Chip 3: Dense Mountain Peaks.

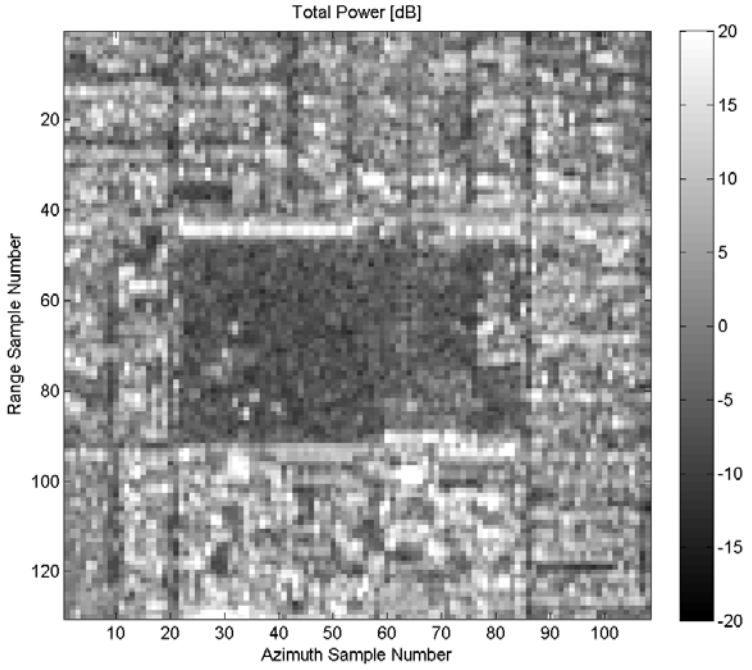


Figure 2-9. Chip 4: Hollywood Forever Memorial Park.

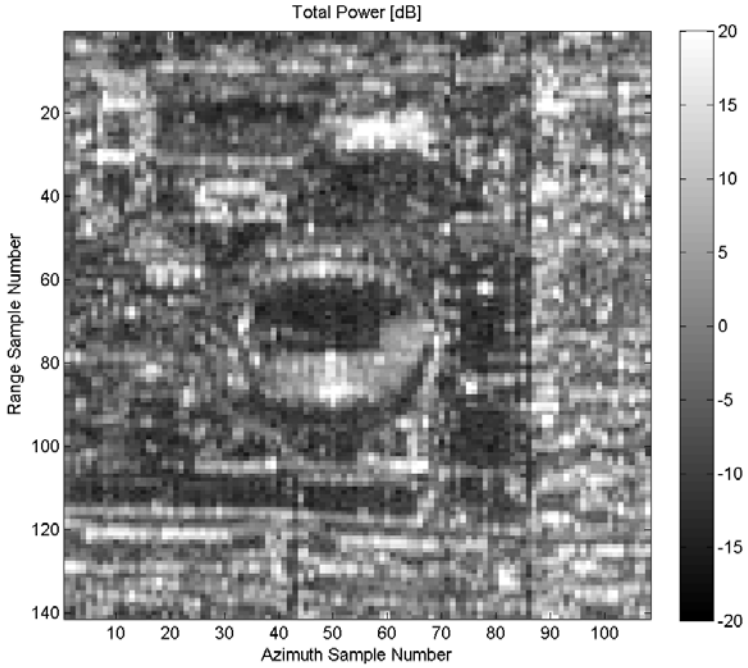


Figure 2-10. Chip 5: Los Angeles Memorial Coliseum.

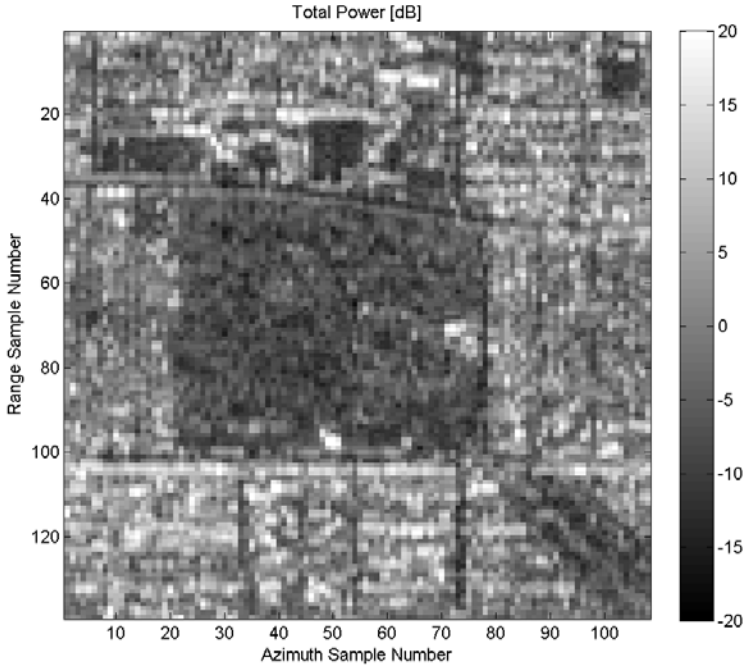


Figure 2-11. Chip 6: Rosedale Cemetery.

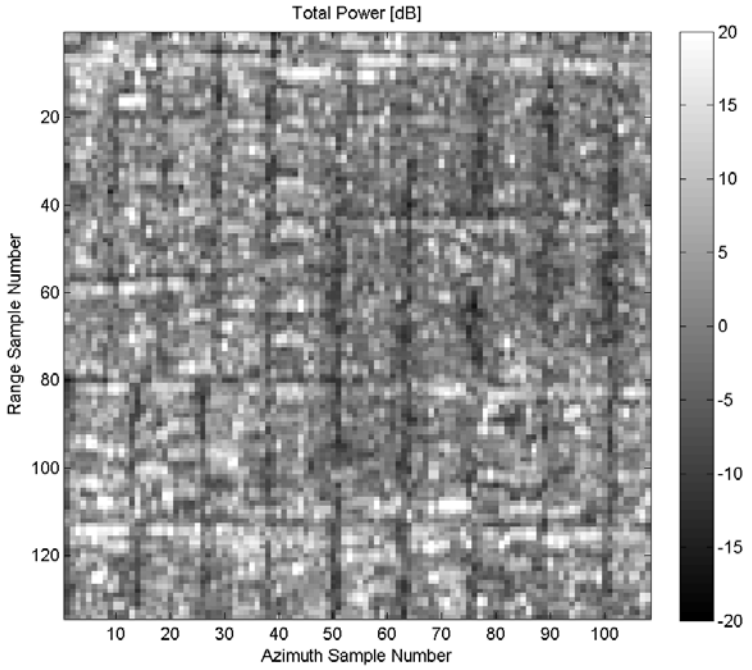


Figure 2-12. Chip 7: High Density Residential.

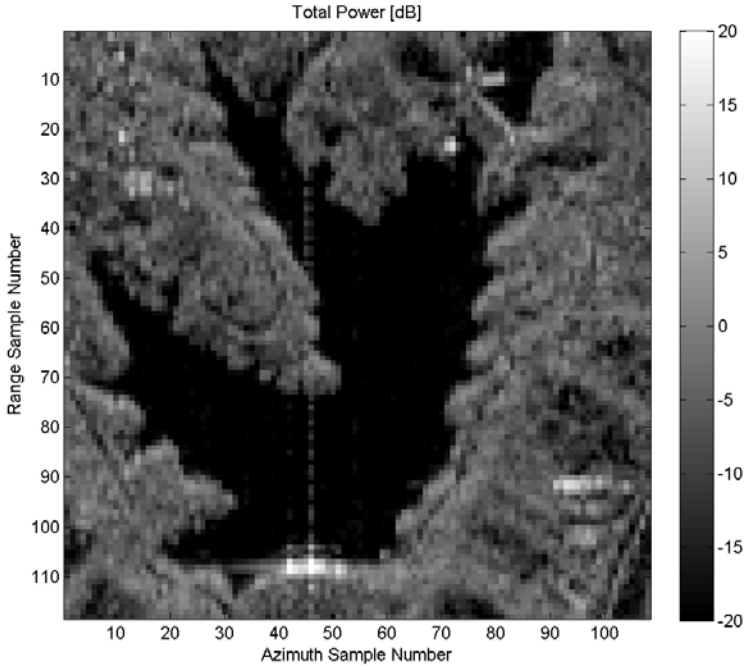


Figure 2-13. Chip 8: Lake.

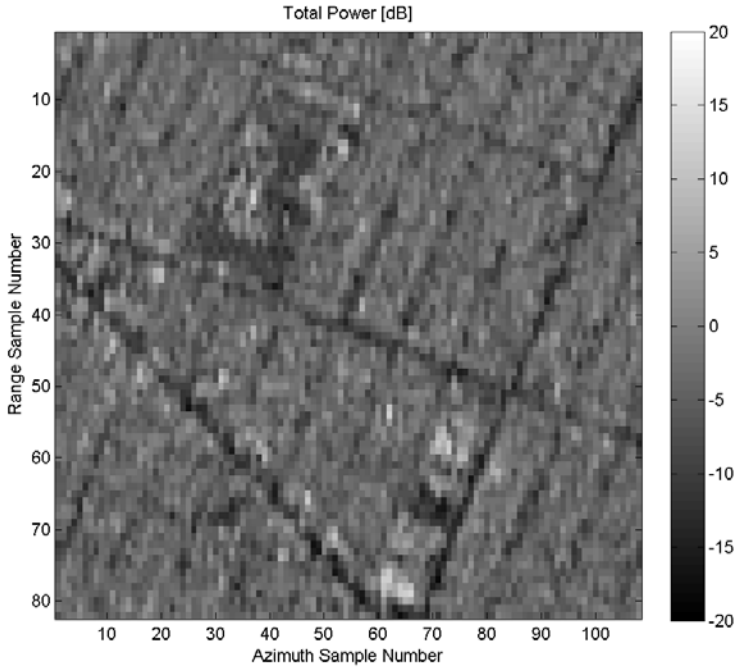


Figure 2-14. Chip 9: Near-Range Residential.

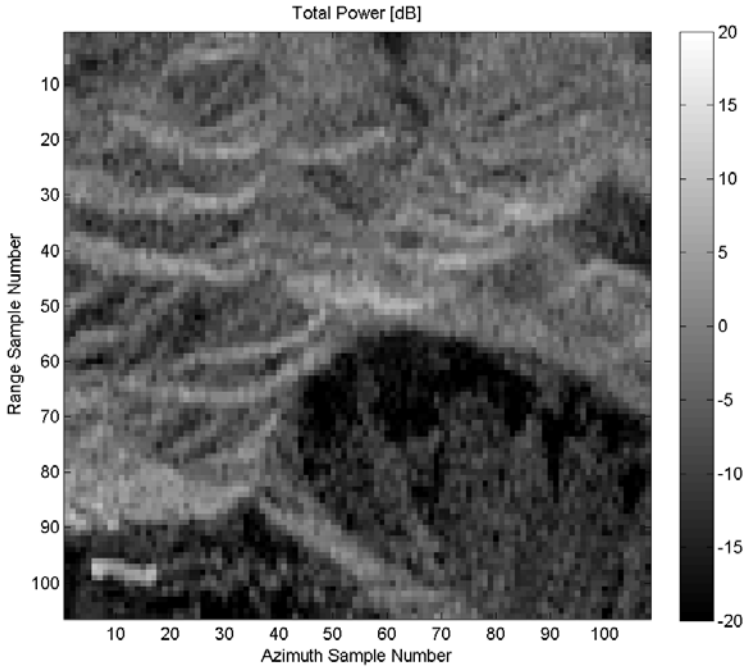


Figure 2-15. Chip 10: Dense Mountain Peaks.

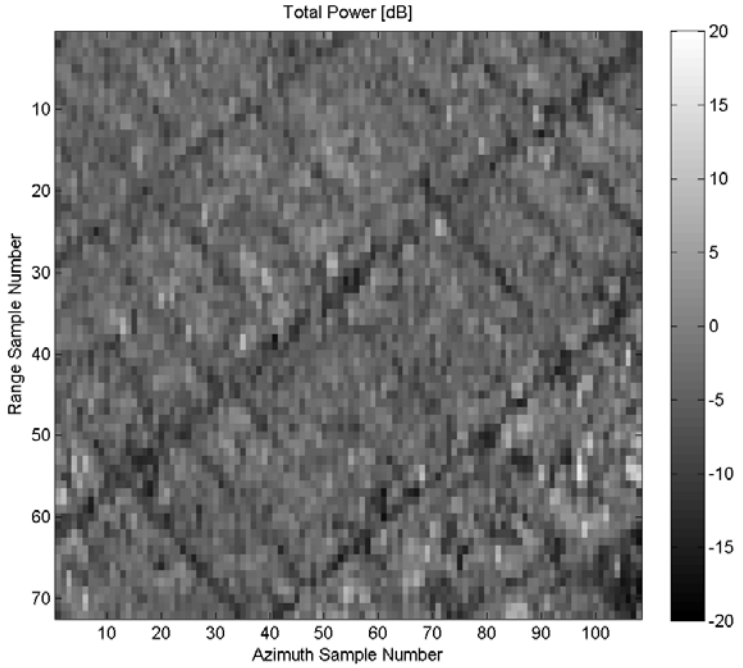


Figure 2-16. Chip 11: Near-Range Residential.

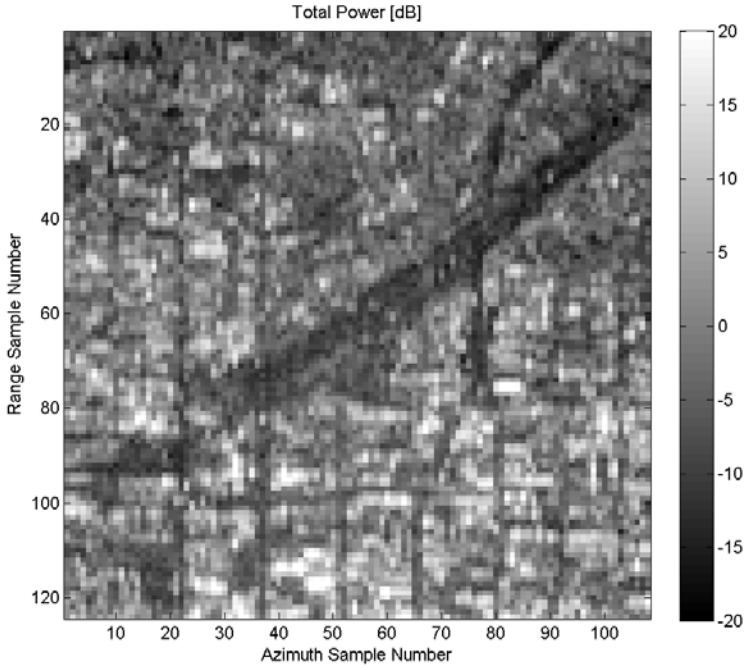


Figure 2-17. Chip 12: Residential & Mountain Base.

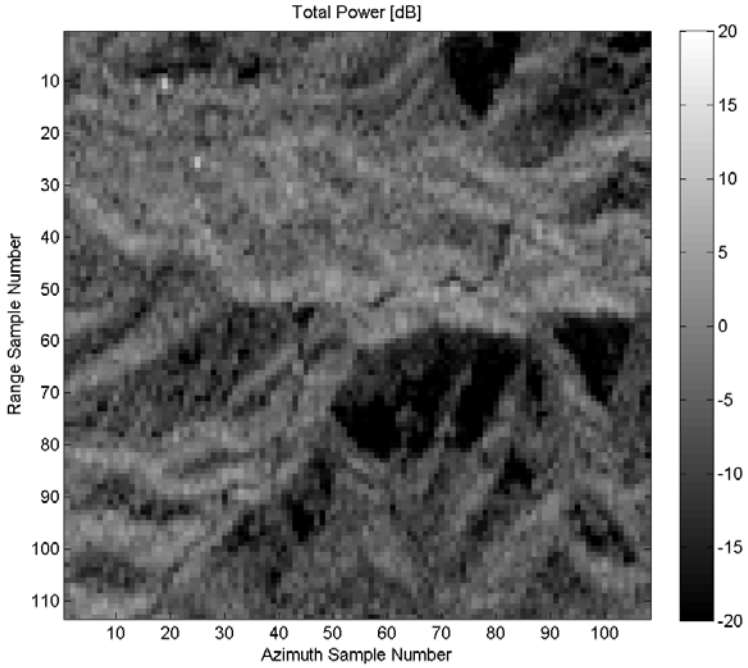


Figure 2-18. Chip 13: Dense Mountain.

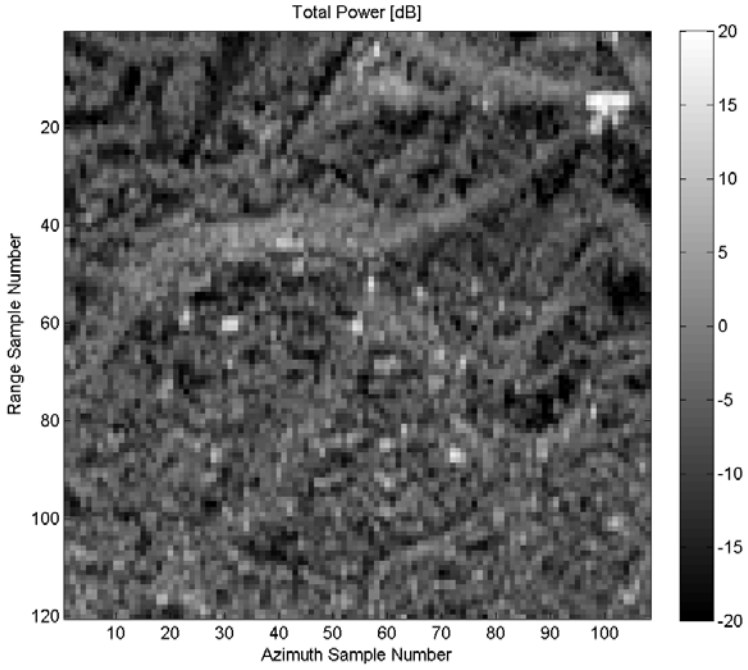


Figure 2-19. Chip 14: Mountain.

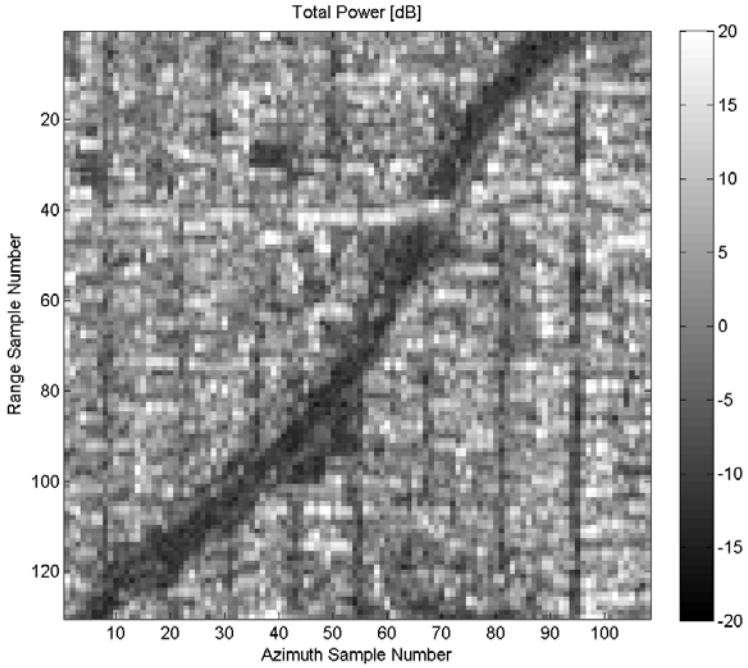


Figure 2-20. Chip 15: Highway 101.

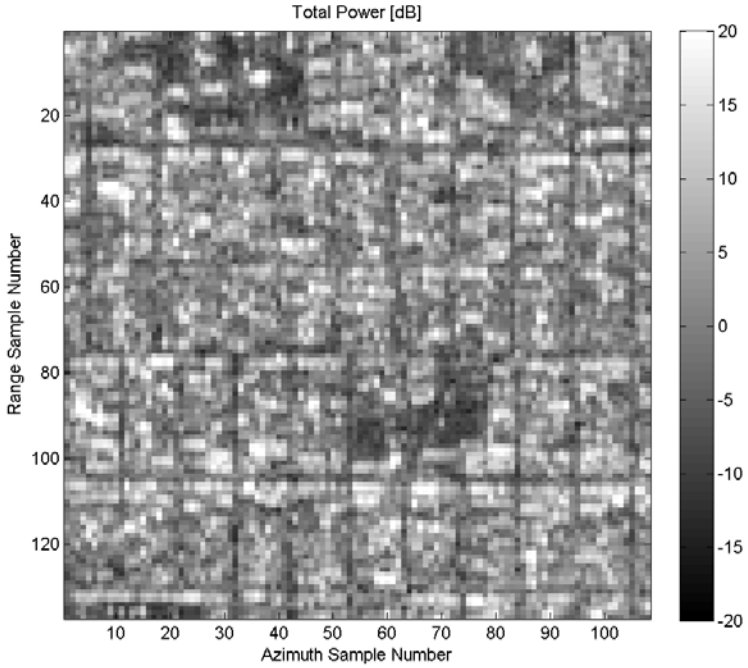


Figure 2-21. Chip 16: High Density Residential.

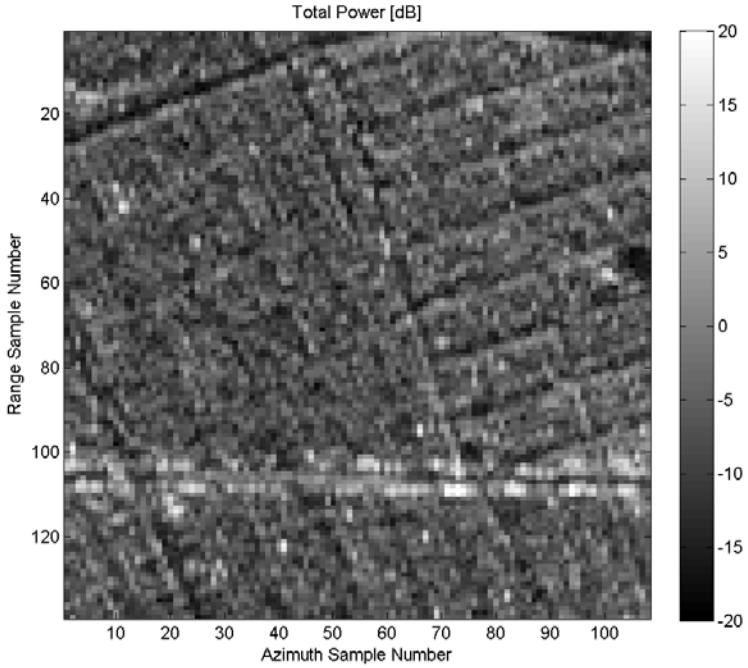


Figure 2-22 Chip 17: Oblique Residential.

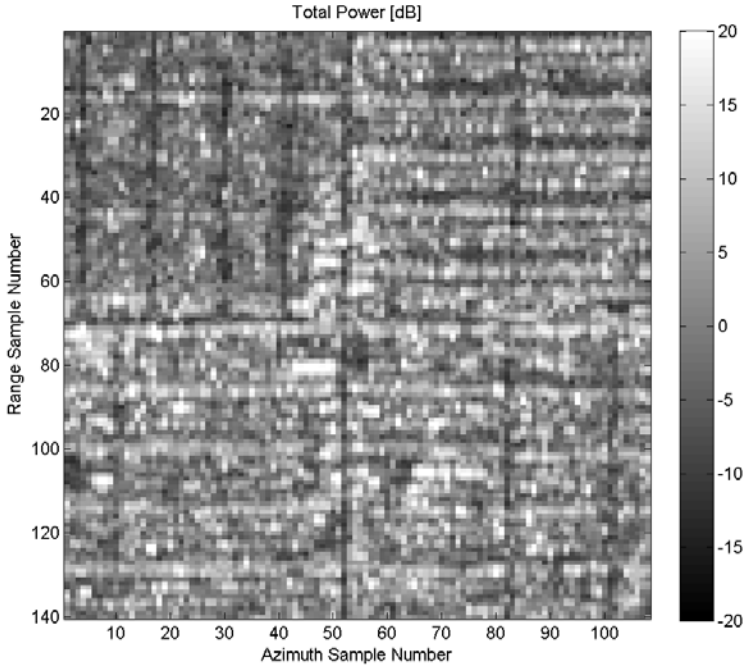


Figure 2-23. Chip 18: Residential (Square).

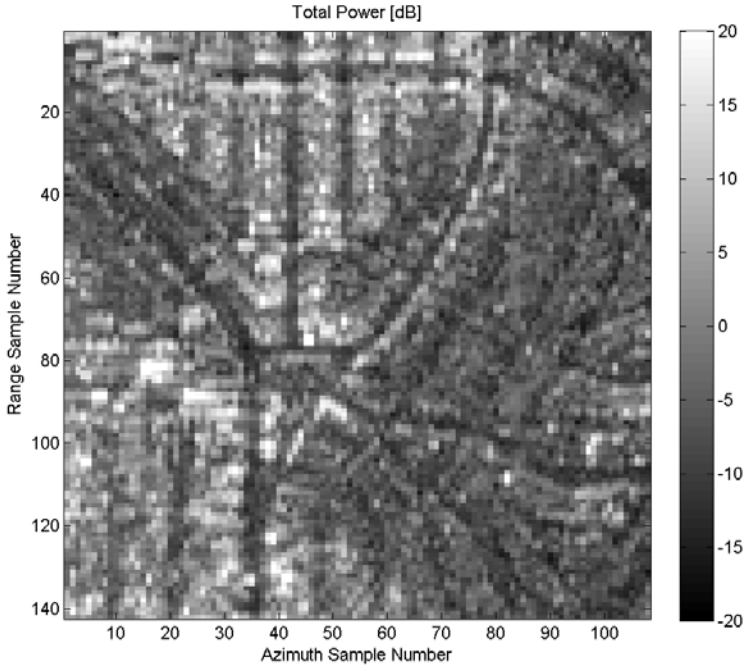


Figure 2-24 Chip 19: Residential with cul-de-sacs.

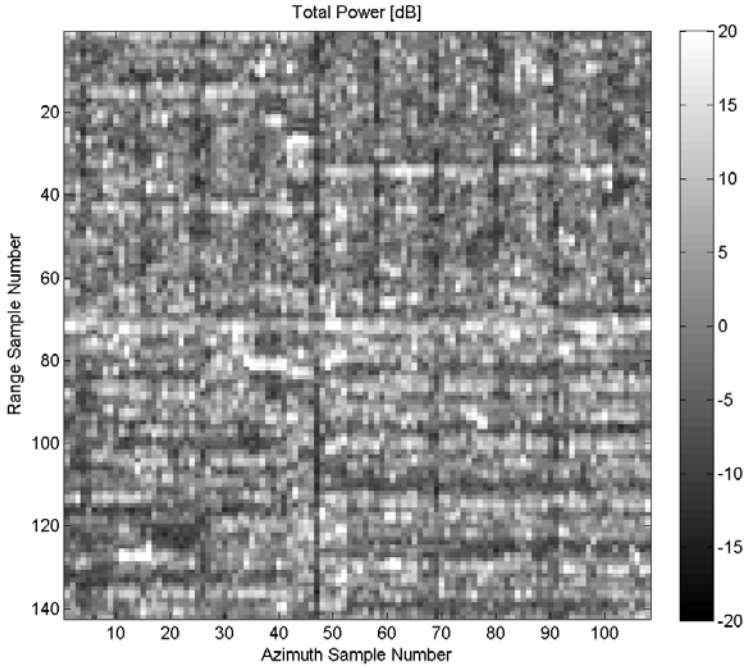


Figure 2-25. Chip 20: High Density Residential.

Chapter 3: Methodology

3.1 Overview

For enhancing PolInSAR techniques to detect and characterize deformation, strategies and approaches for detecting CS candidates from polarimetric imagery were investigated. Fully polarimetric data permit a more direct assessment of the scattering properties. Hence, we assess the improvement in detection of coherent scatterer candidates using polarimetric criteria. From open literature, polarimetric processing methodologies are applied to the LA test site data. For efficient CS processing, detection, and analysis, the primary processing control parameters were studied. Figure 3-1 illustrates a simplified block diagram of the overall approach, which is further discussed in the following sections.

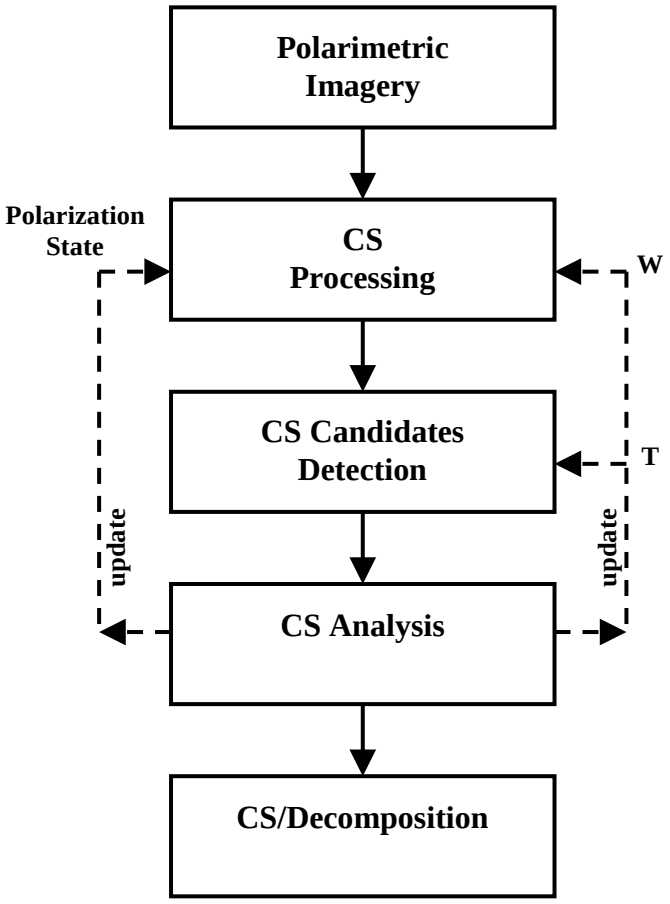


Figure 3-1. Simplified conceptual block diagram of the overall polarimetric coherent scatterer (CS) approach is shown. CS processing is applied for a polarization state and window size (W). CS candidates are detected by applying an appropriate threshold (T). CS candidate outputs are analyzed further using polarimetric decompositions.

3.2 Polarization Response

Polarization describes the movement of the electric field vector in a plane perpendicular to the direction on propagation. An electromagnetic wave, represented in complex number format is described by two parameters namely, the in-phase I and the quadrature Q components. Over the complex domain, the amplitude of the radar signal is expressed as I + *j*Q. The electric field vector of a plane monochromatic wave rotates in a plane perpendicular to the direction of microwave energy propagation and in doing so traces various shapes such as lines, circles and ellipses as shown in Figure 3-2. The angle χ is called as the ellipticity angle, and defines the width of the ellipse. The angle ψ is called the orientation angle, and determines the orientation of the major axis of the ellipse. An illustration of a polarization ellipse is shown in Figure 3-3. The Poincaré sphere is a spherical representation of polarization as shown in Figure 3-4.

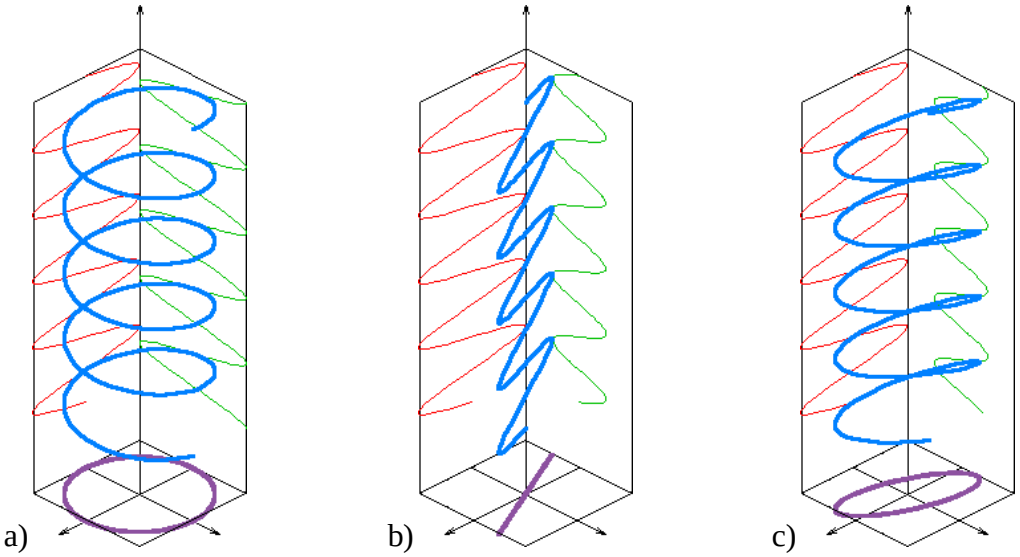


Figure 3-2. Electric field vector tip traces for various polarizations. a) Circular. B) Linear. C) Elliptical. The electric field traveling in space is denoted by dark blue while its horizontal and vertical components are traced in red and green. The observed trace in a perpendicular plane is shown as purple.

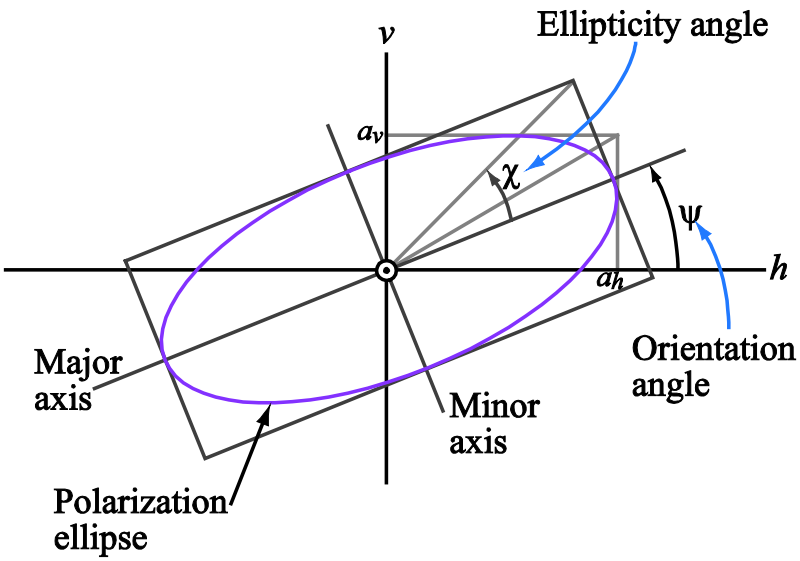


Figure 3-3. Polarization ellipse [Ulaby, 2004].

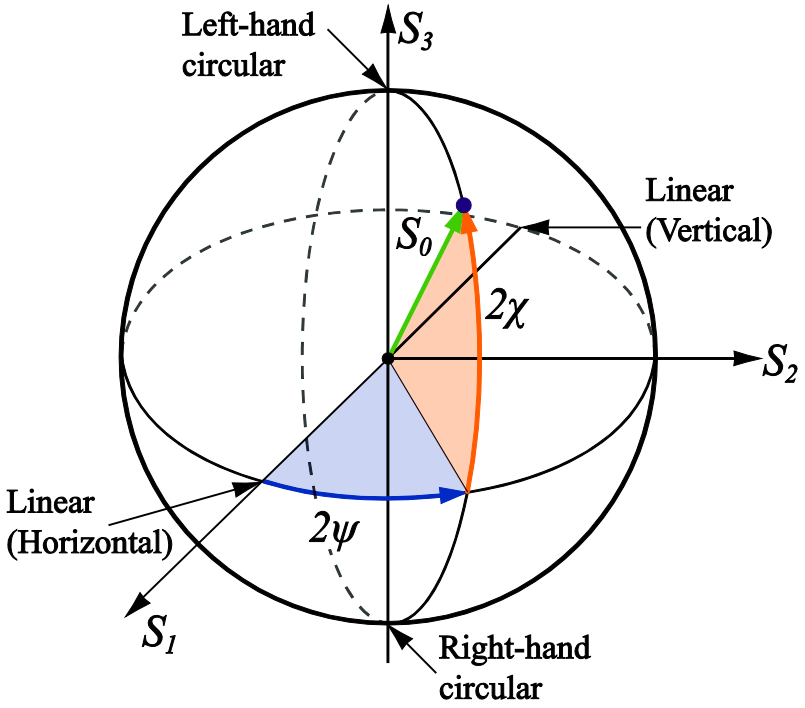


Figure 3-4. Poincaré Sphere.

The complex amplitude [Elachi and van Zyl, 2006] of the wave may be expressed as

$$\boldsymbol{A} = a_h \exp(j\delta_h)\hat{\boldsymbol{h}} + a_v \exp(j\delta_v)\hat{\boldsymbol{v}} \quad 3\text{-}1$$

where, $\hat{\boldsymbol{h}}$ and $\hat{\boldsymbol{v}}$ are orthogonal unit vectors for the horizontal and vertical direction, respectively. Amplitudes, a_h and a_v, and relative phases, δ_h and δ_v , correspond to the horizontal and vertical components, respectively.

A fully polarimetric imaging radar typically measures a target's scattering matrix **S** where each element of the matrix may be a complex quantity.

$$\mathbf{S}_{HV} = \begin{bmatrix} S_{hh} & S_{hv} \\ S_{vh} & S_{vv} \end{bmatrix} \quad 3\text{-}2$$

where element S_{hv} is determined by measuring both the amplitude and phase of the electric field where a vertically polarized wave is transmitted and the scattered wave is received in horizontal polarization.

From the scattering matrix, any transmitting and receiving polarization may be synthesized [Zebker, *et al.*, 1991] using a transformation matrix in the following

$$\mathbf{S}_{AB} = \mathbf{U_2}\mathbf{S}_{HV}\mathbf{U}_2^T \quad 3\text{-}3$$

The transformation matrix, $\mathbf{U_2}$, is a special unitary 2x2 complex matrix, which is an n x n complex matrix $\mathbf{U_2}$ satisfying the condition $\mathbf{U_2}\mathbf{U_2}^{*t}$ equals the identity matrix **I** unitary and has a unit determinant [Hajnsek, 2001]. In this manner, each co-polarization element (S_{aa}) and cross-polarization element (S_{ba}) for each transmit polarization (χ, ψ) can be synthesized. For this study, the angle ellipticity angle χ is varied from -45° to +45° in steps of 5 degrees, and the orientation angle ψ is varied from -90° to +90° in steps of 5 degrees.

Table 3-1. Selected Polarizations.

Polarization Shorthand	*Transmitted Polarization*	*Received Polarization*
HH	Horizontal	Horizontal
HV	Vertical	Horizontal
VH	Horizontal	Vertical
VV	Vertical	Vertical
RR	R. Circular	R. Circular
RL	L. Circular	R. Circular

There exists a unique mapping between the polarization state and a position on the Poincaré sphere. Linear polarizations map to points on the *equator*: H ($\chi = 0, \psi = 0$) , V ($\chi = 0, \psi = \pm 90^o$). Circular polarizations map to the *poles*: L to ($\chi = 45^o, \psi$) and, R to ($\chi = -45^o, \psi$). Mapping is illustrated in Figure 3-5.

One type of polarimetric radar transmits two pulses of differing polarization (e.g. orthogonal, a vertical polarization and horizontal polarization). For each transmitted polarization, two receive polarization measurements are made 1) receive the same polarization transmitted (co-polarization) and 2) receive the polarization orthogonal to the transmitted polarization (cross-polarization). Table 3-1 summarizes a typical naming convention for polarimetric radar measurements.

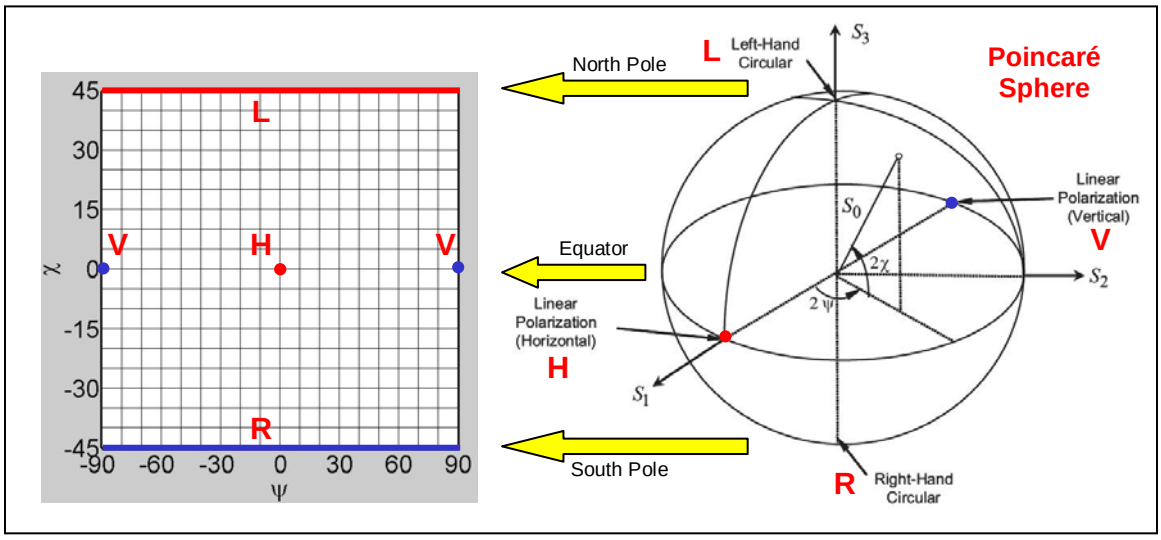
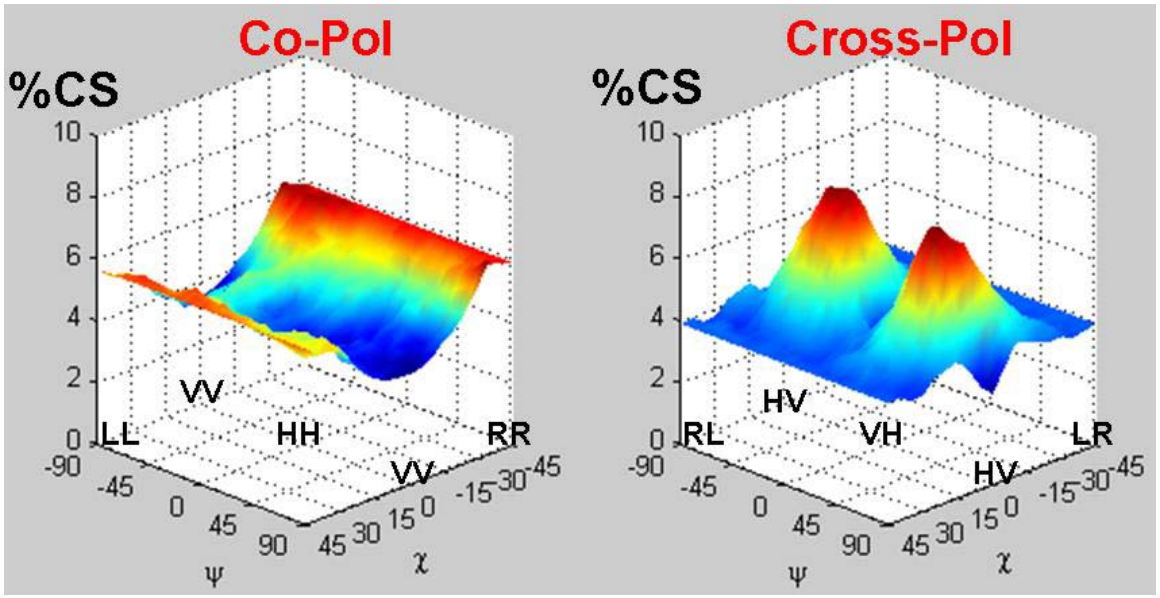


Figure 3-5. Mapping from Poincaré sphere to plane formed by ellipticity and orientation angles. Angle ellipticity angle χ range is -45° to +45°. Orientation angle ψ range is from -90° to +90°.

Copolarization and cross-polarization χ - ψ plane of percentage of coherent scatterers (%CS) may be calculated using the Sublook Correlation (SC) and Sublook Entropy (SE) methods, which are described in Sections 3.4 and 3.5. For the LA scene, the copolarization peaks occur near circular polarizations (χ = ±45°, ψ = all) and the crosspolarization χ - ψ plane of percentage of coherent scatterers (%CS), the peaks occur near linear polarizations (χ = 0°, ψ = ±45°). For non-fully polarimetric commercial satellites, horizontal (χ = 0°, ψ = 0°) or vertical (χ = 0°, ψ = ±90°) linear polarizations are typically utilized. For the LA scene, analyses were done near the maximum responses (χ = -45°, ψ = 0°) for copolarization and (χ = 15°, ψ = 45°) for crosspolarization. An example polarization response is shown in Figure 3-6.



a) b)

Figure 3-6. Polarization response illustration of percentage of coherent scatterers. Angle ellipticity angle χ range is -45° to +45°. Orientation angle ψ range is from -90° to +90°. a) Co-polarization. b) Cross-polarization.

3.3 Image Sublooks

Before performing spectral correlation in the radar range direction, each slant range line in the image is processed to produce two sublooks. First, an unweighting process may be applied to recover the original image spectrum. For the JPL AIRSAR, the weighting function is given by

$$W[k] = H + (1-H)\cos^2\left[\frac{\pi\left(k-\frac{N_r}{2}\right)}{N_r}\right], \text{where } 0 \le H \le 1 \text{ and } 0 \le r \le (N_r - 1) \qquad 3\text{-}4$$

where N_r is the number of range samples. The weighting is centered on the center frequency, and H is the pedestal coefficient as found in mission metadata file as "RANGE WEIGHTING COEFFICIENT" [Chang, 1992; Chapman, 2007]. In this dataset, H is 0.1 [NASA JPL, 2003]. Then, the full spectrum is divided into two sublooks that are shifted to the same central frequency. A half-bandwidth window (e.g. Hamming) is applied to each of the two sub spectra. The inverse Fourier transform for both signals is then performed [Schneider *et al.*,2006].

3.4 Sublook Correlation (SC) Method

The SC approach evaluates the correlation coefficient between two parts of the full image spectrum (i.e. two sub-looks) and associates the pixels with high sub-look correlation values to coherent scatterers. As described in Section 3.3, the full spectrum is divided in two sub-looks that are shifted to the same central frequency in order to avoid any linear phase terms when forming their cross product in time domain. The inverse Fourier transform for both signals is then performed and the normalized correlation coefficient (i.e. coherence) is calculated. Pixels with a higher correlation than a fixed threshold value are interpreted as potential CSs [Schneider et al., 2006]. Primary SC processing control parameters are window size and threshold (i.e. W and T, respectively).

Sublook correlation is a calculated by the correlation between two sublooks X_1 and X_2 as

$$\gamma = \frac{|\langle X_1 X_2^* \rangle|}{\sqrt{\langle X_1 X_1^* \rangle \langle X_2 X_2^* \rangle}}, 0 \leq \gamma \leq 1 \qquad 3\text{-}5$$

where * denotes complex conjugation, $|\cdot|$ denotes absolute value, and $\langle \cdot \rangle$ denotes ensemble averaging over the window, W [Schneider *et al.*, 2006]. Here, the correlation coefficient γ is a normalized complex cross-correlation; moreover, since radar speckle is largely uncorrelated noise while radar targets have similar statistics between different squint angles (range sublooks), the interlook correlation γ tendency will be lower for speckle while correlated pixels like CS targets will tend to have higher values [Ouchi *et al.*, 2004]. Scatterers with a higher correlation than a given threshold are interpreted as CS candidates.

3.5 Sublook Entropy (SE) Method

The SE approach evaluates the entropy measure among sub-look images (see Section 3.3). Thus, if the local mean power of the sub-look images is the same, then the resulting entropy is a function only of the correlation coefficients between sub-look images. Accordingly, the entropy becomes zero when all the correlation coefficients reach their maximum values (i.e. all the images are similar to each other). On the other hand, the entropy will reach its maximum (i.e. one) when all the correlation coefficients become zero (i.e. all images are different to each other). Hence, in order to obtain the pixels in the image with high spectral correlation, a threshold can be used to select only pixels with low entropy. This will force a high correlation among all the sublook images [Schneider et al., 2006]. Primary SE processing control parameters are window size and threshold (i.e. W and T, respectively). For the LA imagery, a window size of 4 range

pixels by 3 azimuth pixels was selected. Thresholds selection will be discussed further in Chapter 4.

Sublook entropy is calculated between two sublooks X_1 and X_2 as

$$H = -\sum_{i=1}^{N} p_i \log_N p_i \, , 0 \leq H \leq 1 \qquad 3\text{-}6$$

$$p_i = \frac{\lambda_i}{\sum_{j=1}^{N} \lambda_j} \qquad 3\text{-}7$$

where $\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_N \geq 0$ and λ_i are the real nonnegative Eigenvalues [Wesstein, 2002] of the positive semidefinite Hermitian covariance matrix $[C]$ for the N sublook images

$$[C] = \begin{bmatrix} \langle X_1 X_1^* \rangle & \langle X_1 X_2^* \rangle & \cdots & \langle X_1 X_N^* \rangle \\ \langle X_2 X_1^* \rangle & \langle X_2 X_2^* \rangle & & \vdots \\ \vdots & & \ddots & \vdots \\ \langle X_N X_1^* \rangle & \cdots & \cdots & \langle X_N X_N^* \rangle \end{bmatrix}. \qquad 3\text{-}8$$

For this project, the number of sublooks, *N*, is two.

3.6 Alpha-Entropy (α/H) Polarimetric Decomposition

To explore the behavior of SC and SE CSs, the CSs' scattering mechanisms were explored using the Alpha-Entropy polarimetric decomposition [Cloude and Pottier, 1997]. A dominant or average scattering mechanism is assumed for each radar pixel, which may be described by two parameters, scattering entropy (H) and alpha angle (α). Scattering entropy is a measure of the roughness and polarization dependence of the scattering data. Alpha angle correlates with a pixel's average scattering mechanism [Cloude and Pottier, 1997]. Note that this polarimetric entropy should not be confused with the Sublook Entropy in Section 3.5. From the 2 x 2 scattering matrix **S**, the coherency matrix **T** is calculated as

$$\langle [T] \rangle = \frac{1}{2} \left\langle \begin{bmatrix} (S_{HH} + S_{VV})(S_{HH} + S_{VV})^* & (S_{HH} + S_{VV})(S_{HH} - S_{VV})^* & 2(S_{HH} + S_{VV})S_{HV}^* \\ (S_{HH} - S_{VV})(S_{HH} + S_{VV})^* & (S_{HH} - S_{VV})(S_{HH} - S_{VV})^* & 2(S_{HH} - S_{VV})S_{HV}^* \\ 2S_{HV}(S_{HH} + S_{VV})^* & 2S_{HV}(S_{HH} - S_{VV})^* & 4S_{HV}S_{HV}^* \end{bmatrix} \right\rangle$$

3-9

Next, Eigen decomposition [Wesstein, 2002] of **T** yields

$$\langle [T] \rangle = [U_3] \begin{bmatrix} \lambda_1 & 0 & 0 \\ 0 & \lambda_2 & 0 \\ 0 & 0 & \lambda_3 \end{bmatrix} [U_3]^{*T} \text{ where } \lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_N \geq 0 \qquad 3\text{-}10$$

as in Sublook Entropy, and $[U_3]$ contains eigenvectors $[e_i]$ as its columns. Each column eigenvector has the form

$$[e_i] = \begin{bmatrix} \cos \alpha_i \\ \sin \alpha_i \cos \beta_i \exp(j\delta_i) \\ \sin \alpha_i \sin \beta_i \exp(j\gamma_i) \end{bmatrix} \qquad 3\text{-}11$$

so that α_i may be recovered as $\arccos\left(\sqrt{[e_i]_1 [e_i]_1^*}\right)$ and

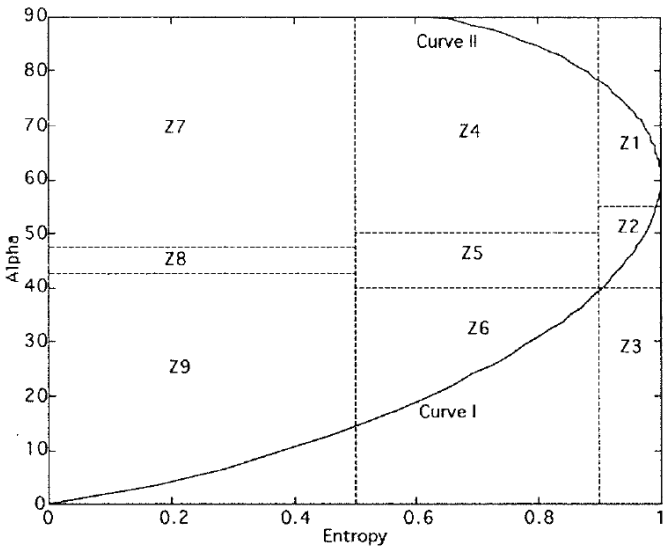
$$p_i = \frac{\lambda_i}{\sum_{j=1}^{N} \lambda_j}. \qquad 3\text{-}12$$

Finally, entropy and alpha are formed

$$\bar{\alpha} = \sum_{i=1}^{3} p_i \alpha_i \qquad 3\text{-}13$$

$$\bar{H} = \sum_{i=1}^{3} p_i \log_3(p_i) \qquad 3\text{-}14$$

Figure 3-6 illustrates the α-H plane which contains all possible values for alpha angle (0-90 degrees) and scattering entropy (0-1).



Zone 1: High Entropy Multiple Scattering
Zone 2: High Entropy Vegetation Scattering
Zone 3: High Entropy Surface Scatter
Zone 4: Medium Entropy Multiple Scattering
Zone 5: Medium Entropy Vegetation Scatter
Zone 6: Medium Entropy Surface Scatter
Zone 7: Low Entropy Multiple Scattering
Zone 8: Low Entropy Dipole Scattering
Zone 9: Low Entropy Surface Scatter

Figure 3-6. The α-H plane [Cloude & Pottier, 1997].

3.7 Freeman-Durden (F/D) Polarimetric Decomposition

To explore the behavior of SC and SE CSs, the CSs' scattering mechanisms were explored using the Freeman-Durden (F/D) polarimetric decomposition [Freeman and Durden, 1998]. F/D decomposition is based a three-component scattering model for polarimetric SAR data. This method models the ratio of three scattering models: volume scattering (F_v), surface scattering (F_s), and double-bounce scattering (F_d). Freeman and Durden's volume scattering occurs from uniformly randomly oriented and very thin cylinders, similar to a forest canopy. Double-bounce scatterers are modeled as scattering from dihedral corner reflector, similar to a trunk-ground interaction in a forest or sharp corners of an urban environment. Surface scattering is modeled using a Bragg model in second-order statistics [Freeman and Durden, 1998]. F/D model equations are as follows:

$$\langle |S_{HH}|^2 \rangle = F_s|\beta|^2 + F_d|\alpha|^2 \quad \text{3-15}$$

$$\langle |S_{VV}|^2 \rangle = F_s + F_d \quad \text{3-16}$$

$$\langle S_{HH}S_{VV}^* \rangle = F_s\beta + F_d\alpha \quad \text{3-17}$$

which are related to power conservation as

$$P = P_s + P_d + P_v \stackrel{\text{def}}{=} (|S_{HH}|^2 + 2|S_{HV}|^2 + |S_{VV}|^2) \quad \text{3-18}$$

$$P_s = F_s(1 + |\beta|^2) \quad \text{3-19}$$

$$P_d = F_d(1 + |\alpha|^2) \quad \text{3-20}$$

$$P_v = 8F_d/3 \quad \text{3-21}$$

In normalized form, the fractional contribution for each pixel to the three scattering types are given

$$Fs = \frac{P_s}{P} \quad \text{3-22}$$

$$Fd = \frac{P_d}{P} \quad \text{3-23}$$

$$Fv = \frac{P_v}{P} \quad \text{3-24}$$

3.8 Polarimetric Decomposition Averages

Average polarimetric decomposition values may be calculated for CS pixels and non-CS pixels (NCS). For average values for CS pixels, the average is calculated as

$$\tilde{x}_{CS} = \frac{\sum_{\in CS} N_{x,i}\mu_{x,i}}{\sum_{\in CS} N_{x,i}} \tag{3-25}$$

where i is the scenario number, $N_{x,i}$ is the number of CSs for scenario i, $\mu_{x,i}$ is the average decomposition value for scenario i, and x is one of the polarimetric decomposition (α, H, Fs, Fd, Fv). For average values for NCS pixels, the average is calculated as

$$\tilde{y}_{NCS} = \frac{\sum_{\in NCS} N_{y,i}\mu_{y,i}}{\sum_{\in NCS} N_{y,i}} \tag{3-26}$$

where i is the scenario number, $N_{y,i}$ is the number of NCSs for scenario i, $\mu_{y,i}$ is the average decomposition value for scenario i, and y is one of the polarimetric decomposition (α, H, Fs, Fd, Fv).

Percent change of CS polarimetric decomposition average relative to NCS polarimetric decomposition average may be calculated as

$$dz = \frac{\tilde{x}_{CS} - \tilde{y}_{NCS}}{\tilde{y}_{NCS}} \times 100\% \tag{3-27}$$

where z is one of the polarimetric decomposition (α, H, Fs, Fd, Fv). Thus, values are referenced to NCS case (+ increase/-decrease).

Chapter 4: Results and Discussion

4.1 Introduction

An investigation of coherent scatterers using fully polarimetric data was performed. JPL AIRSAR data over Los Angeles, as discussed in Chapter 2, were processed using the Chapter 3 methodologies. For each chip, Appendix B for SC method and Appendix C for SE method tabulate by threshold the CS outputs and polarimetric decomposition values for the standard polarization states (HH, VV, VH) and the overall maximum copolarization and crosspolarization state.

Further refined analysis on the data from Appendices B and C were performed. For SC and SE methods, the CS threshold was selected as a value 0.6, which resulted in percentage of CS from about 1% to 12% for the twenty data chips. For the polarimetric decompositions, the decomposition values were analyzed further by values belonging to CS pixels and values belonging to NCS pixels using the Chapter 3 methodology. The following sections discuss these investigations.

4.2 Sublook Correlation

Percentage of coherent scatterers (%CS) using the SC method for each data chip is illustrated in Figure 4-1. For the overall copolarization (RR) and crosspolarization

maxima (15, 45), the %CS exceed the values of the standard polarization (HH, VV, VH). The %CS values are lowest (~2-4%) in an absolute sense for the mainly dense mountain data chips 3, 10, and 13; moreover, the number of CS is increased by about 20-40% for the maxima polarization when compared to the standard polarization with the most CS.

The remaining data chips (1, 2, 4-9, 11, 12, 14-20) consist of various combinations of residential and other land types. The %CS values range from about 3% to 12%, or nearly three times quantity found in the mainly dense mountain chips. In Figure 4-1, HH mainly outperforms the other standard polarizations (VV, VH); however, for chips near the foothills (12 and 14), %CS for HH and VV were nearly the same. For data chip 4 containing residential and the Hollywood Forever Memorial Park and data chip 15 containing residential and a portion of Highway 101, the %CS for HH is about the same as the maxima polarization. SC %CS trends are similar for the various polarizations with the maxima polarizations increasing the number of CS by about 20-40% for most cases when compared to the standard polarization HH, and about doubling the number of CS for most cases when compared to the standard polarizations VV and VH.

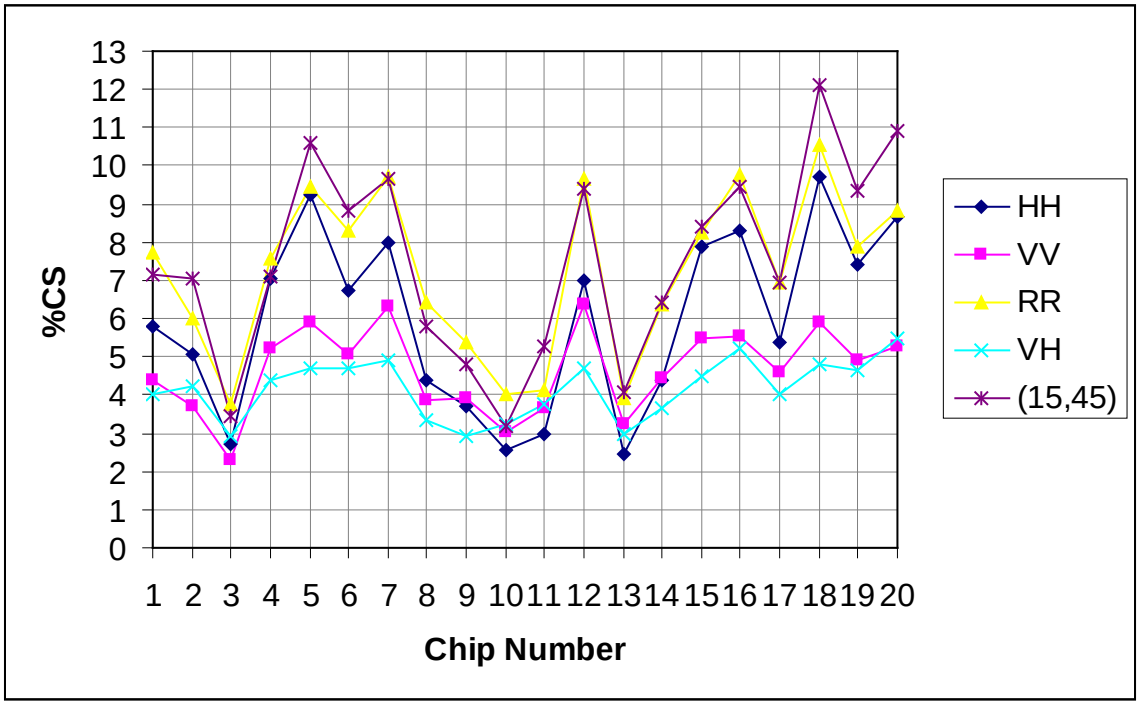


Figure 4-1. Percentage of coherent scatterers (CS) for each chip using the sublook correlation (SC) method. Shown are polarizations HH, VV, RR, VH, and (15, 45).

4.3 Sublook Entropy

Percentage of coherent scatterers (%CS) using the SE method for each data chip is illustrated in Figure 4-2. For the overall copolarization (RR) and crosspolarization maxima (15, 45), the %CS exceed the values of the standard polarization (HH, VV, VH). The %CS values are lowest (~1-3%) in an absolute sense for the mainly dense mountain data chips 3, 10, and 13; moreover, the number of CS is increased from about 15-30% for the maxima polarization when compared to the standard polarization with the most CS.

The remaining data chips (1, 2, 4-9, 11, 12, 14-20) consist of various combinations of residential and other land types. The %CS values range from about 2% to 9%, or nearly three times the quantity found in the mainly dense mountain chips. In Figure 4-2, HH mainly outperforms the other standard polarizations (VV, VH); however, for chips near the foothill (14) and lake (8), %CS for HH and VV were nearly the same. SE %CS trends are similar for the various polarizations with the maxima polarizations increasing the number of CS by about 20-40% for most cases when compared to the standard polarization HH, and about doubling the number of CS for most cases when compared to the standard polarizations VV and VH.

SE method %CS trend performance was similar to SC %CS method for the data chips examined in this study.

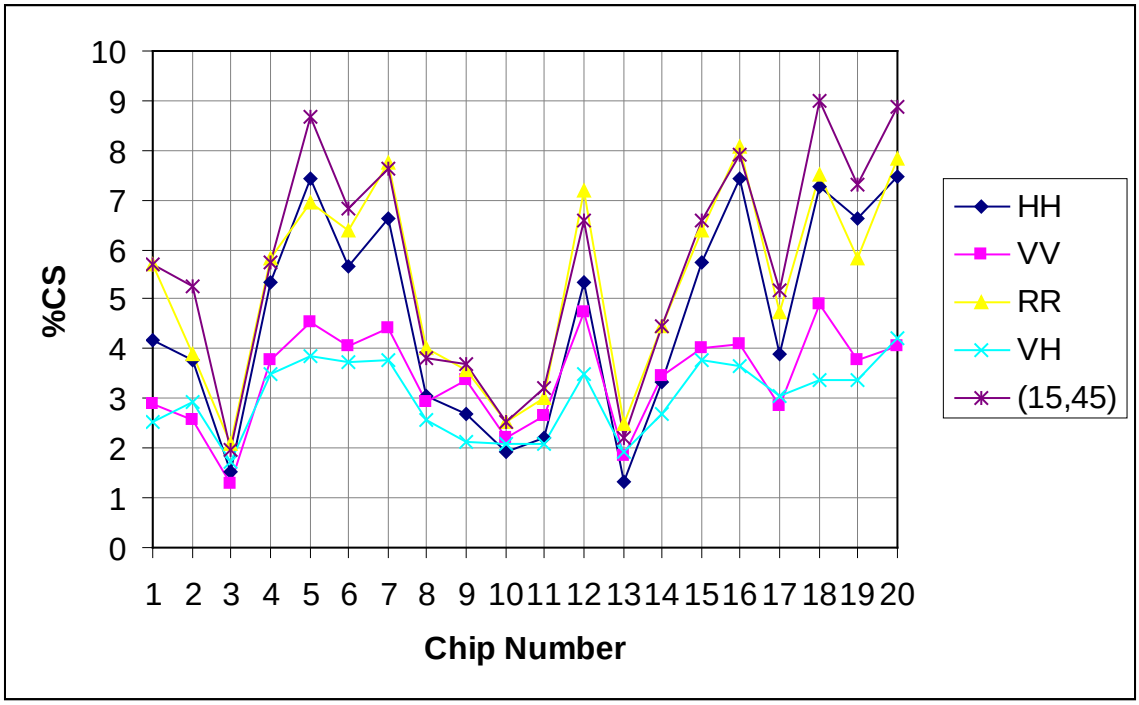


Figure 4-2. Percentage of coherent scatterers (CS) for each chip using the sublook correlation (SC) method. Shown are polarizations HH, VV, RR, VH, and (15, 45).

4.4 Polarimetric Decomposition

Average polarimetric decomposition values for the CS pixels and non-CS pixels (NCS) were investigated. Figure 4-3 summarizes the coherent scatterer percent changes (d*H*, d*Fd*, d*Fs*, d*Fv*, d*A* or dα) in polarimetric decomposition values for each chip.

A number of chip specific observations were made. Very little change was observed in the dense mountain chips 3, 7, and 10. Large positive surface scattering (*Fs*) changes of about 12% and 19% were observed for chips 5 (LA Memorial Coliseum) and 19 (Residential with cul-de-sacs), respectively. Chip 8 (lake) showed a large positive (>30%) increase in double-bounce scattering (*Fd*). Chips 1 (golf course), 4 (Hollywood Forever Memorial Park), 5 (Los Angeles Memorial Coliseum), 6 (Rosedale Cemetery), 12 (residential and mountain base), and 19 (residential with cul-de-sacs) showed a large decrease (>10%) in volume scattering (*Fv*).

Overall statistical performance (mean ± standard deviation) of each decomposition change over the data chips were observed; moreover, percent change statistics were about -4.1±2.8 for d*H*, 0.7±1.1 for d*A*, 10.3±7.9 for d*Fd*, 1.9±6.3 for d*Fd*, and -7.2±5.9 for d*Fv*. Alpha (α) and surface scattering component (*Fs*) showed little variation between CS and NCS on average. CS on average had lower polarimetric entropy (*H*) and volumetric scattering (*Fv*) then for the NCS. In contrast, the double-bounce scattering (*Fd*) increased for the CS on average when compared to the NCS.

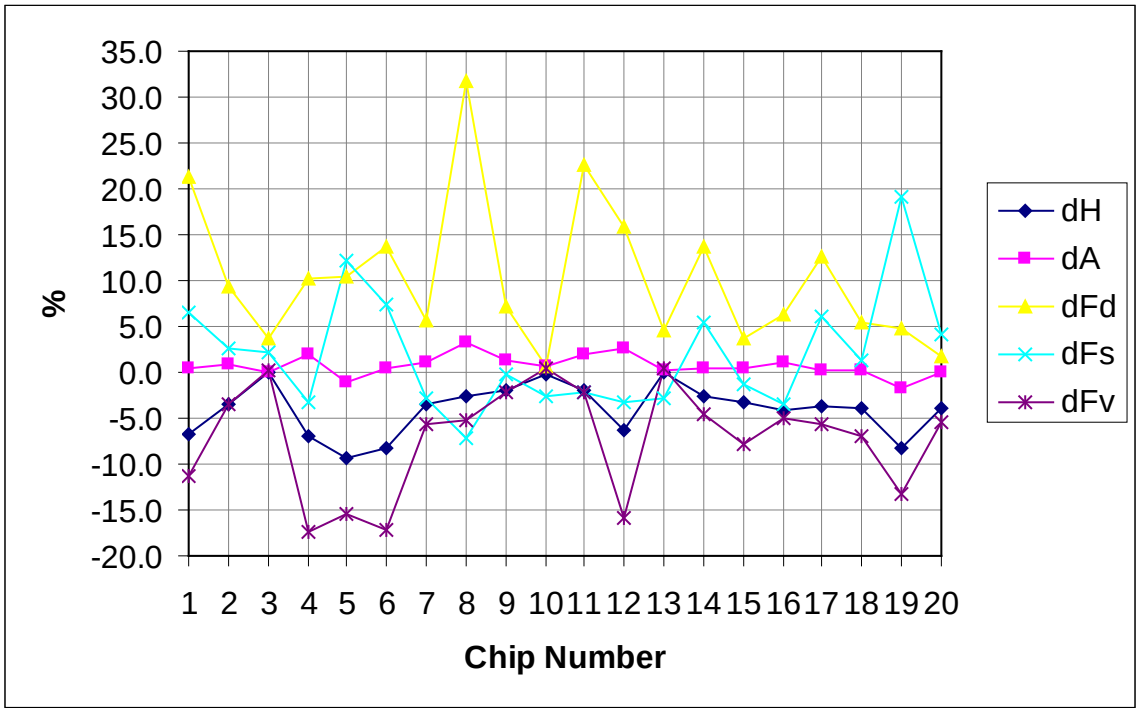


Figure 4-3. Coherent scatterer percent changes in polarimetric decomposition values are shown for each chip. Values are referenced to non coherent scatterer case (+ increase/- decrease).

4.5 Summary

An investigation of coherent scatterers using fully polarimetric data was performed on JPL AIRSAR data from the LA region. CS candidates were selected using the SC and SE methods. Selection of the overall maximum polarization showed increase of CS candidates compared to standard polarizations. Typically, a 20-40% increase in CS was observed compared to HH; moreover, up to about 100% increase was observed for VV and VH polarizations in a number of cases. In addition, polarimetric decomposition (α-*H* and *F*/*D*) analysis of CS and NCS pixels found a trend of increasing *Fd* with decreasing *Fv* and *H* for CS relative to NCS.

Chapter 5: Conclusion and Future Direction

5.1 Study Summary

This investigation demonstrated the polarimetric behavior of CS for a number of data chips over LA region. A number of polarimetric methods from the literature were applied to JPL AIRSAR imagery of LA. Strategies for identifying CS candidates were investigated. In addition, the thresholds for the SC method and SE method were explored and tabulated. For the LA region, the nonstandard maxima polarization states typically provided the most CS candidates; moreover, the standard polarization HH typically produced the most CS candidates from among the standard polarizations. Polarimetric decomposition (α-*H* and *F*/*D*) analysis of CS and NCS pixels found a trend of increasing *Fd* with decreasing *Fv* and *H* for CS relative to NCS.

The %CS values are lowest (~1-4%) in an absolute sense for the mainly dense mountain data chips 3, 10, and 13; moreover, the number of CS is increased from about 15-40% for the maxima polarization when compared to the standard polarization with the most CS. The remaining data chips (1, 2, 4-9, 11, 12, 14-20) consist of various combinations of residential and other land types. The %CS values range from about 2% to 12%, or nearly three times the quantity found in the mainly dense mountain chips,

which have much lower %CS and thus would be more challenging for InSAR IPTA. Thus, polarization selection may significantly help in these situations.

5.2 Future Direction

This study's findings may contribute to the future directions of CS research. With the recent launch of Radarsat-2 and other sensors, fully polarimetric commercial satellite imagery is now available. Using polarimetric imagery, polarimetric interferometry may be investigated. Study of interferometry products using polarimetric-based CS could be explored and assessed. In addition, the increase of quantity of fully polarimetric imagery stacks of data for various locations on the earth can provide additional opportunity to evaluate the performances for multiple sites.

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Appendix A: Chip Polarization Power Images

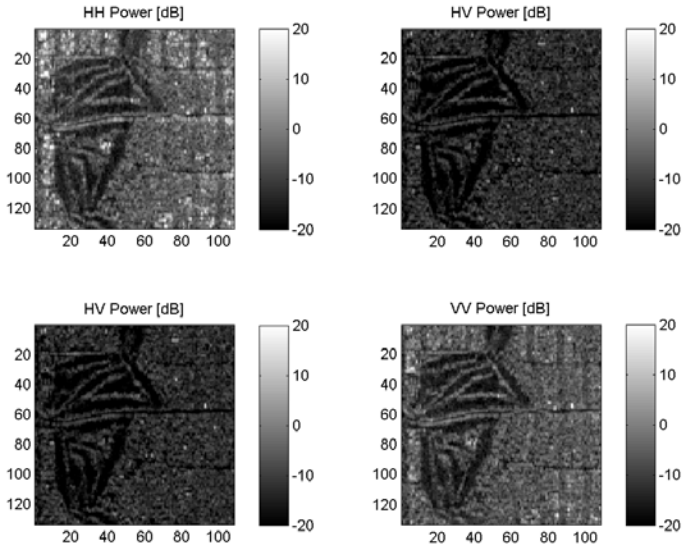

Figure A-1. Chip 1: Golf Course

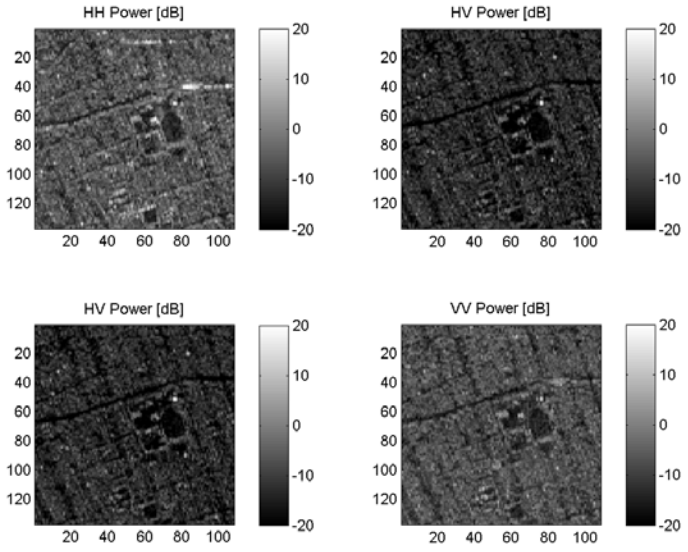

Figure A-2. Chip 2: Oblique Residential

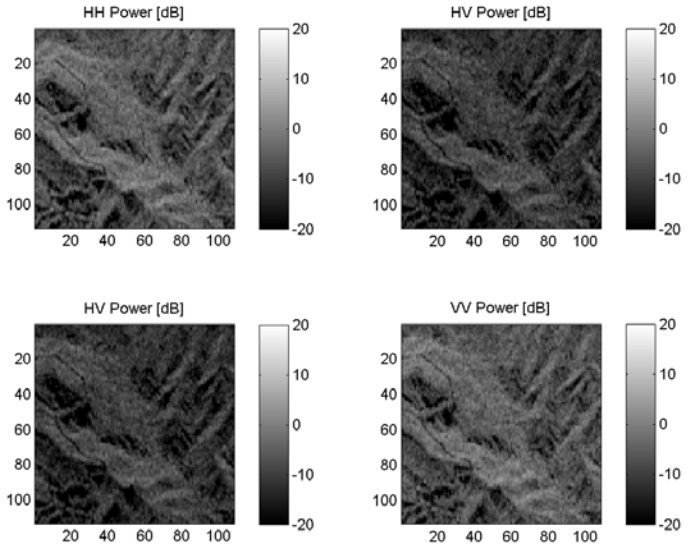

Figure A-3. Chip 3: Dense Mountain Peaks

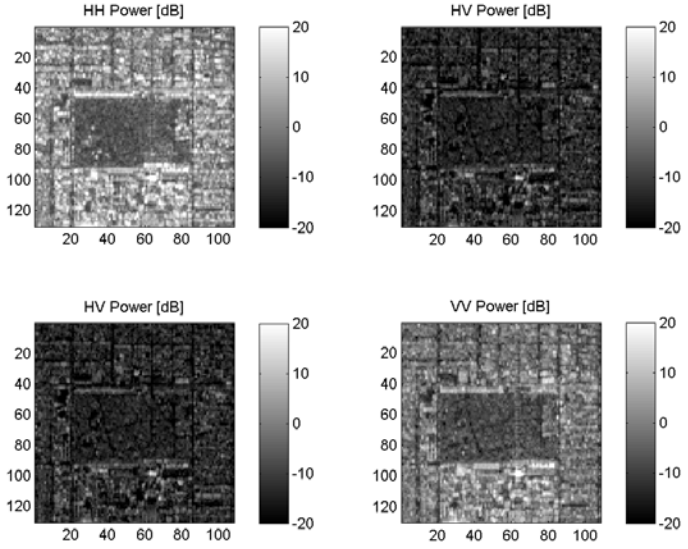

Figure A-4. Chip 4: Hollywood Forever Memorial Park

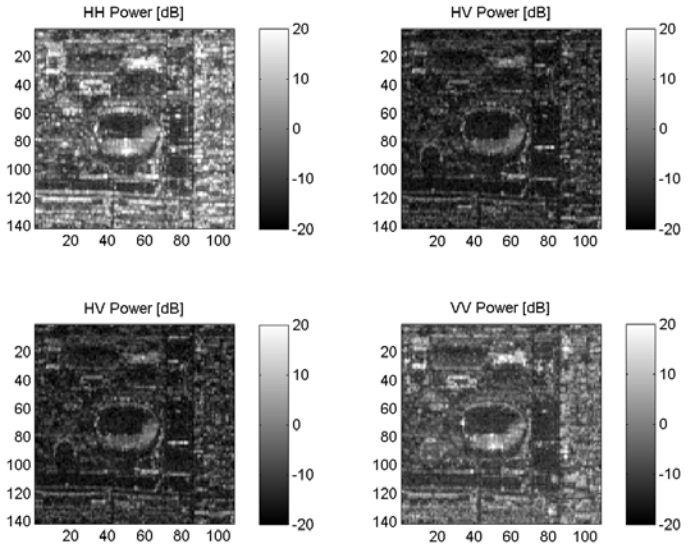

Figure A-5. Chip 5: Los Angeles Memorial Coliseum

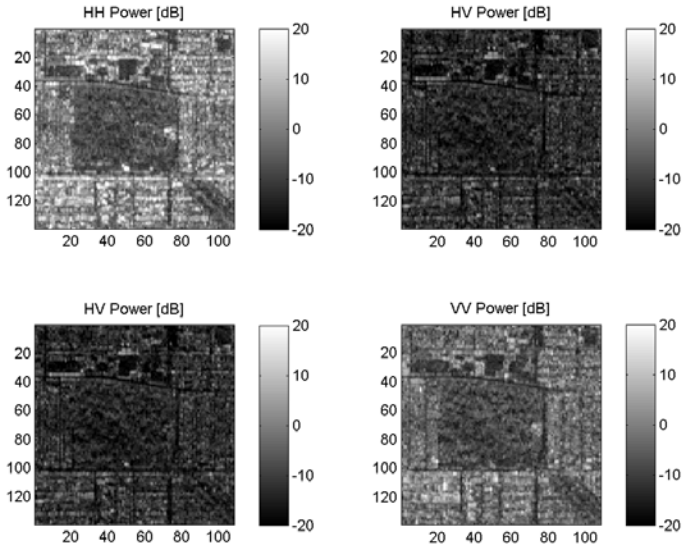

Figure A-6. Chip 6: Rosedale Cemetery

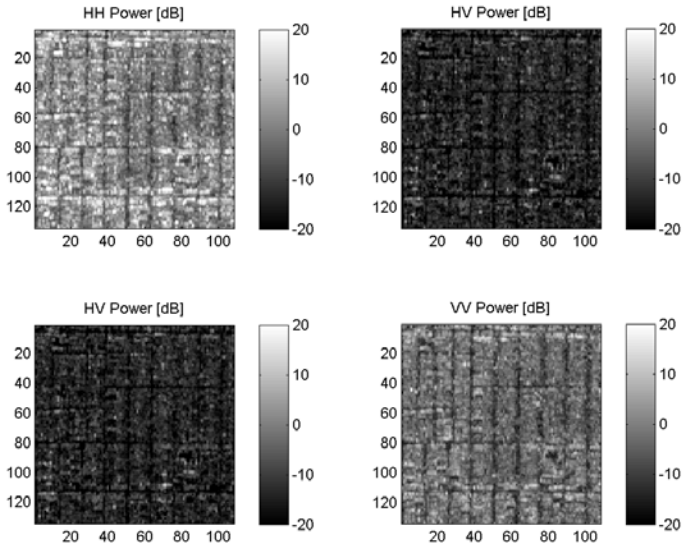

Figure A-7. Chip 7: High Density Residential

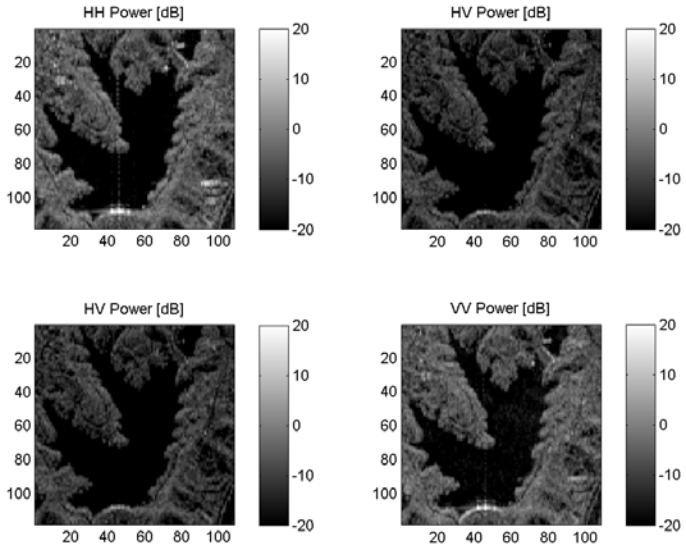

Figure A-8. Chip 8: Lake

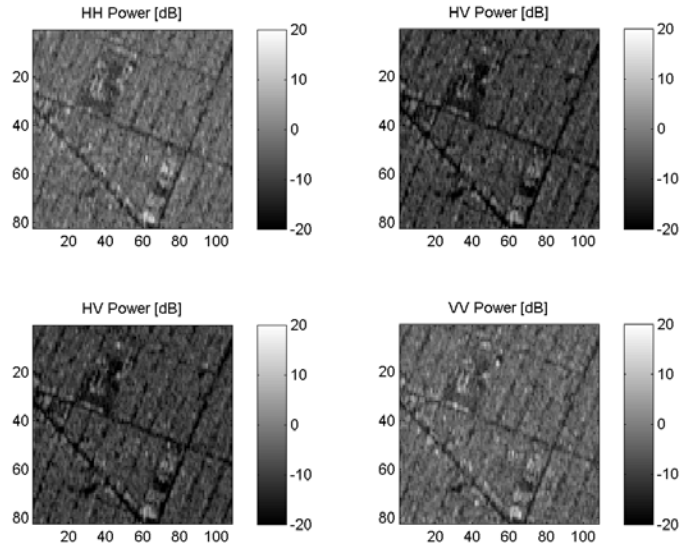

Figure A-9. Chip 9: Near-Range Residential

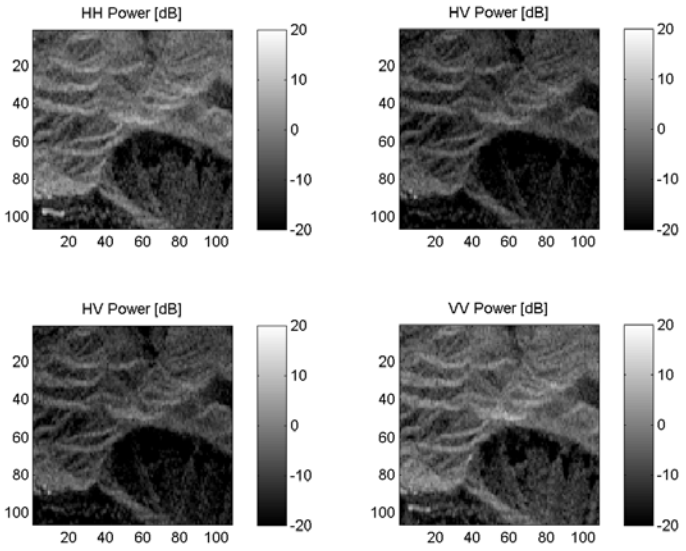

Figure A-10. Chip 10: Dense Mountain Peaks

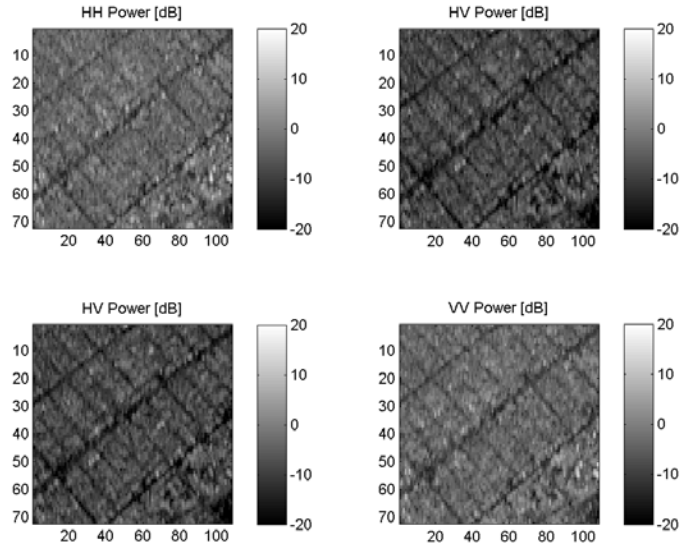

Figure A-11. Chip 11: Near-Range Residential

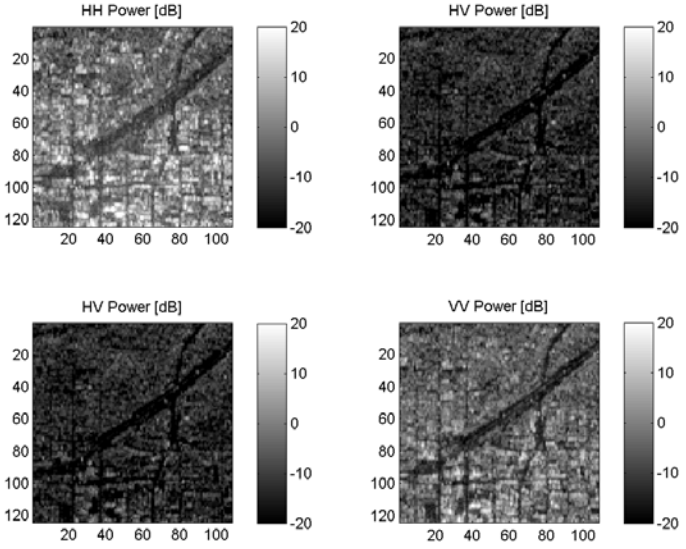

Figure A-12. Chip 12: Residential + Mountain Base

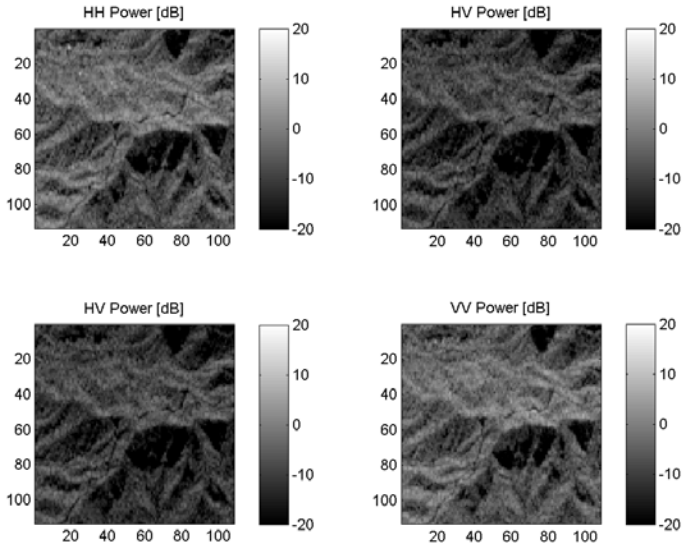

Figure A-13. Chip 13: Dense Mountain

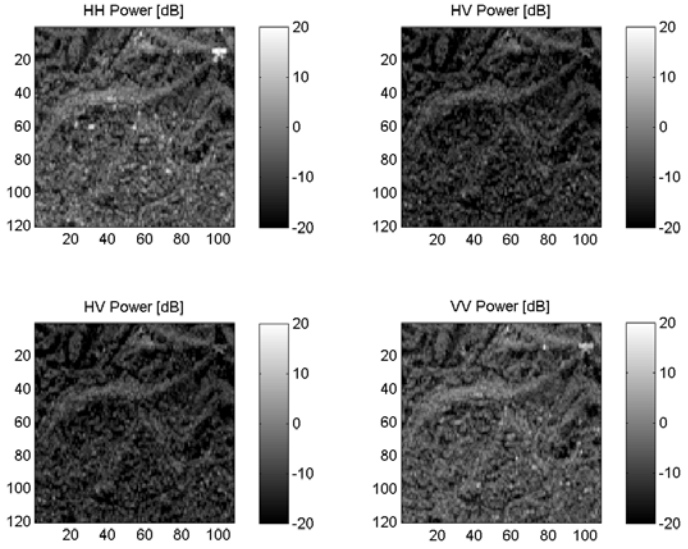

Figure A-14. Chip 14: Mountain

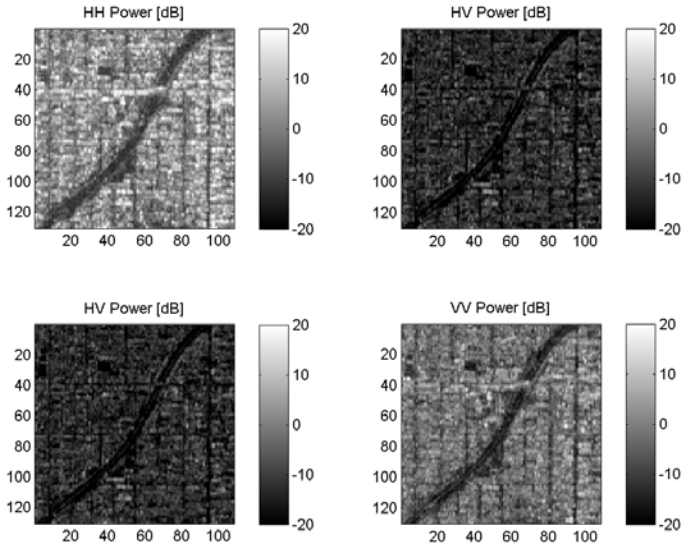

Figure A-15. Chip 15: Highway 101

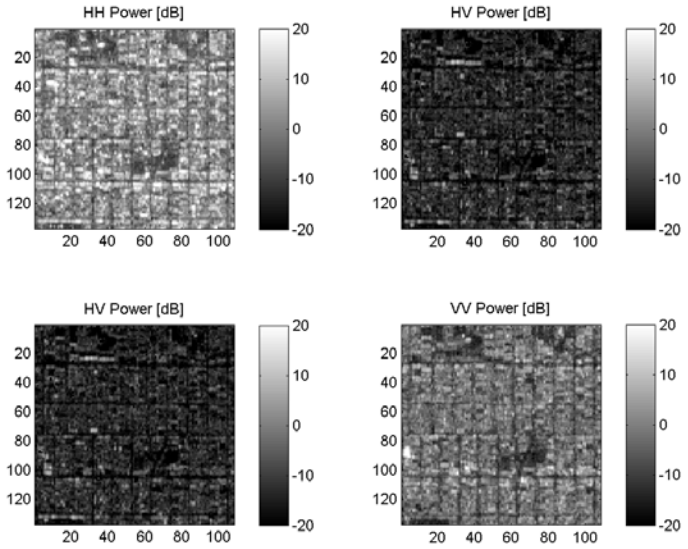

Figure A-16. Chip 16: High Density Residential

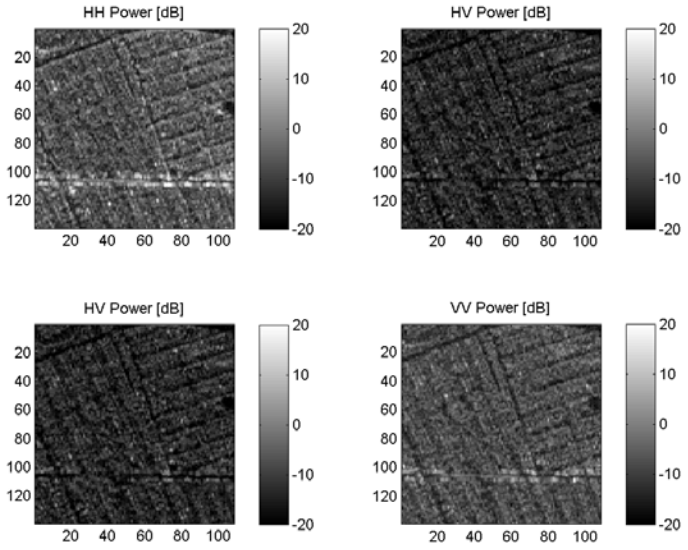

Figure A-17. Chip 17: Oblique Residential

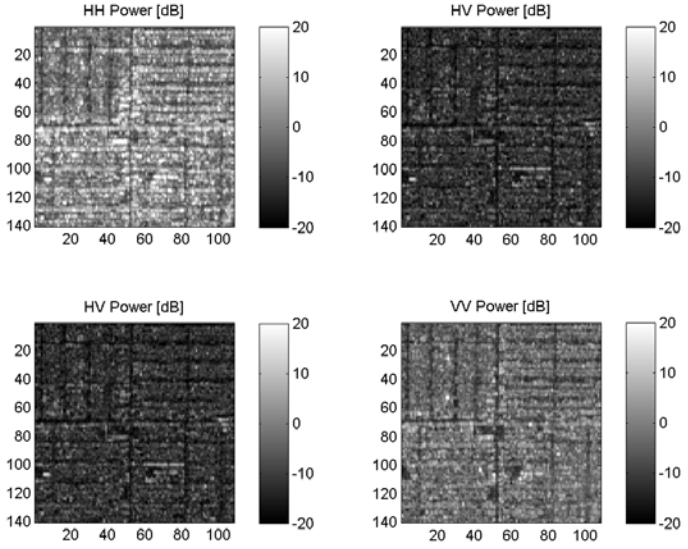

Figure A-18. Chip 18: Residential (square)

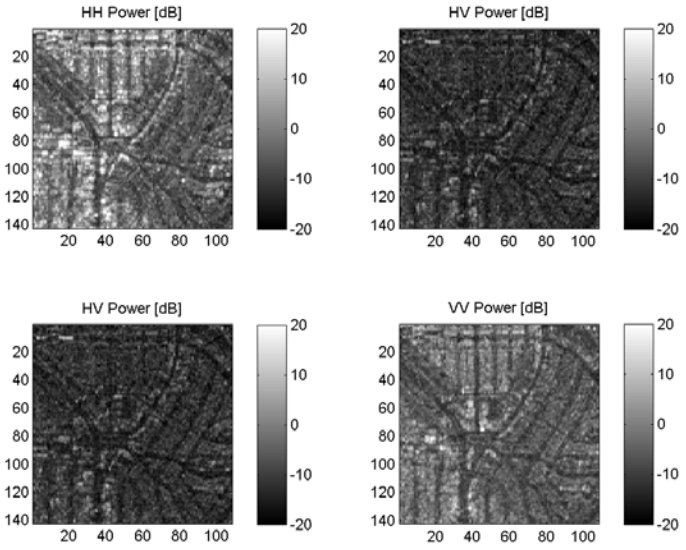

Figure A-19. Chip 19: Residential with cul-de-sacs

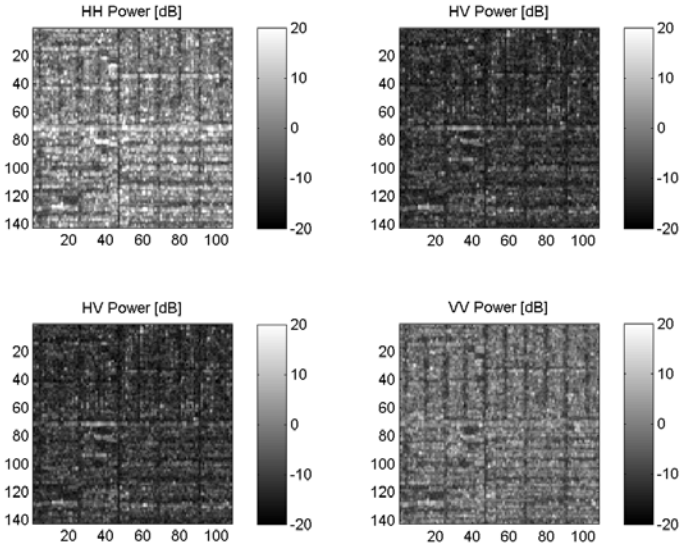

Figure A-20. Chip 20: High Density Residential

Appendix B: Coherent Scatterer Response Tables – Sublook Correlation Method

The following tables display the results of Sublook Correlation analysis. Each data chip has a separate table comparing selected polarizations in terms of both SC value distributions and the polarimetric parameters. N_x is the number of pixels within the SC range indicated in the "Range" column. For the polarimetric decomposition parameters, the displayed values are the statistical mean and standard deviation for each decomposition parameter of those same pixels classified with the SC value indicated in the "Range" column.

Table B-1. SC Chip 1: Golf Course

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14364	100%	14364	100%	14364	100%	0.0-1.0	14364	100%	14364	100%
N_5	0.8-1.0	52	0%	31	0%	84	1%	0.8-1.0	24	0%	57	0%
N_4	0.6-0.8	781	5%	602	4%	1028	7%	0.6-0.8	555	4%	969	7%
N_3	0.4-0.6	3101	22%	2878	20%	3866	27%	0.4-0.6	2801	20%	3631	25%
N_2	0.2-0.4	6193	43%	6217	43%	6112	43%	0.2-0.4	6295	44%	6079	42%
N_1	0.0-0.2	4237	29%	4636	32%	3274	23%	0.0-0.2	4689	33%	3628	25%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.57	0.10	0.64	0.09	0.59	0.10	0.8-1.0	0.69	0.06	0.61	0.08
	0.6-0.8	0.65	0.09	0.68	0.09	0.66	0.09	0.6-0.8	0.69	0.09	0.66	0.09
	0.4-0.6	0.68	0.09	0.69	0.09	0.69	0.09	0.4-0.6	0.70	0.09	0.69	0.09
	0.2-0.4	0.70	0.08	0.70	0.08	0.70	0.08	0.2-0.4	0.70	0.08	0.70	0.08
	0.0-0.2	0.71	0.07	0.70	0.08	0.71	0.08	0.0-0.2	0.70	0.08	0.71	0.08
A	0.8-1.0	46.16	3.14	46.13	3.50	46.19	3.21	0.8-1.0	46.60	2.26	46.46	3.44
	0.6-0.8	45.86	3.40	45.90	3.49	46.22	3.14	0.6-0.8	46.29	3.06	45.96	3.38
	0.4-0.6	46.14	3.19	45.98	3.27	46.06	3.16	0.4-0.6	46.07	3.17	46.01	3.14
	0.2-0.4	45.97	3.17	45.97	3.17	45.85	3.23	0.2-0.4	45.93	3.24	45.97	3.24
	0.0-0.2	45.74	3.23	45.86	3.17	45.86	3.22	0.0-0.2	45.81	3.20	45.78	3.15
Fd	0.8-1.0	0.37	0.13	0.31	0.14	0.36	0.12	0.8-1.0	0.26	0.09	0.35	0.11
	0.6-0.8	0.27	0.12	0.25	0.12	0.27	0.12	0.6-0.8	0.25	0.11	0.27	0.12
	0.4-0.6	0.25	0.11	0.24	0.11	0.24	0.11	0.4-0.6	0.23	0.11	0.24	0.11
	0.2-0.4	0.23	0.10	0.23	0.11	0.22	0.10	0.2-0.4	0.23	0.11	0.23	0.10
	0.0-0.2	0.21	0.10	0.23	0.10	0.22	0.10	0.0-0.2	0.23	0.10	0.22	0.10
Fs	0.8-1.0	0.25	0.09	0.23	0.07	0.25	0.09	0.8-1.0	0.20	0.08	0.24	0.08
	0.6-0.8	0.25	0.10	0.23	0.10	0.24	0.09	0.6-0.8	0.22	0.08	0.24	0.09
	0.4-0.6	0.23	0.09	0.23	0.09	0.23	0.09	0.4-0.6	0.22	0.09	0.23	0.09
	0.2-0.4	0.22	0.09	0.23	0.09	0.23	0.09	0.2-0.4	0.23	0.09	0.22	0.09
	0.0-0.2	0.22	0.09	0.23	0.09	0.22	0.09	0.0-0.2	0.23	0.09	0.22	0.09
Fv	0.8-1.0	0.37	0.12	0.46	0.13	0.39	0.13	0.8-1.0	0.54	0.08	0.41	0.09
	0.6-0.8	0.48	0.15	0.52	0.14	0.49	0.14	0.6-0.8	0.53	0.14	0.49	0.14
	0.4-0.6	0.52	0.14	0.53	0.14	0.53	0.14	0.4-0.6	0.54	0.14	0.53	0.14
	0.2-0.4	0.55	0.13	0.54	0.13	0.55	0.13	0.2-0.4	0.54	0.13	0.55	0.13
	0.0-0.2	0.56	0.12	0.55	0.13	0.56	0.13	0.0-0.2	0.54	0.13	0.56	0.12

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-2. SC Chip 2: Oblique Residential

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14796	100%	14796	100%	14796	100%	0.0-1.0	14796	100%	14796	100%
N_5	0.8-1.0	42	0%	25	0%	43	0%	0.8-1.0	28	0%	46	0%
N_4	0.6-0.8	705	5%	523	4%	846	6%	0.6-0.8	601	4%	994	7%
N_3	0.4-0.6	2983	20%	2825	19%	3837	26%	0.4-0.6	2870	19%	3798	26%
N_2	0.2-0.4	6520	44%	6530	44%	6593	45%	0.2-0.4	6377	43%	6439	44%
N_1	0.0-0.2	4546	31%	4893	33%	3477	23%	0.0-0.2	4920	33%	3519	24%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.69	0.05	0.68	0.08	0.70	0.07	0.8-1.0	0.69	0.05	0.68	0.07
	0.6-0.8	0.69	0.07	0.70	0.07	0.70	0.07	0.6-0.8	0.71	0.06	0.69	0.07
	0.4-0.6	0.71	0.07	0.71	0.06	0.71	0.07	0.4-0.6	0.71	0.06	0.71	0.06
	0.2-0.4	0.72	0.06	0.71	0.06	0.72	0.06	0.2-0.4	0.71	0.06	0.72	0.06
	0.0-0.2	0.72	0.05	0.72	0.05	0.72	0.05	0.0-0.2	0.72	0.05	0.72	0.05
A	0.8-1.0	47.59	3.73	46.45	2.14	48.78	3.31	0.8-1.0	48.48	2.88	46.64	4.41
	0.6-0.8	47.05	3.05	46.92	2.82	47.42	2.87	0.6-0.8	47.58	2.98	47.07	3.04
	0.4-0.6	46.93	2.95	46.78	2.79	46.88	2.83	0.4-0.6	46.95	2.90	46.91	2.82
	0.2-0.4	46.82	2.79	46.81	2.80	46.83	2.82	0.2-0.4	46.82	2.80	46.81	2.77
	0.0-0.2	46.73	2.67	46.88	2.83	46.61	2.70	0.0-0.2	46.67	2.71	46.71	2.75
Fd	0.8-1.0	0.23	0.10	0.23	0.07	0.21	0.08	0.8-1.0	0.18	0.07	0.21	0.10
	0.6-0.8	0.22	0.10	0.22	0.09	0.21	0.09	0.6-0.8	0.20	0.09	0.21	0.10
	0.4-0.6	0.20	0.09	0.20	0.08	0.20	0.08	0.4-0.6	0.20	0.08	0.20	0.08
	0.2-0.4	0.19	0.08	0.20	0.08	0.19	0.08	0.2-0.4	0.20	0.08	0.19	0.08
	0.0-0.2	0.19	0.07	0.19	0.08	0.19	0.08	0.0-0.2	0.20	0.08	0.19	0.08
Fs	0.8-1.0	0.21	0.07	0.21	0.06	0.18	0.08	0.8-1.0	0.18	0.06	0.23	0.12
	0.6-0.8	0.20	0.08	0.20	0.07	0.19	0.07	0.6-0.8	0.18	0.07	0.20	0.08
	0.4-0.6	0.20	0.07	0.20	0.07	0.20	0.07	0.4-0.6	0.19	0.07	0.19	0.07
	0.2-0.4	0.19	0.07	0.19	0.07	0.19	0.07	0.2-0.4	0.20	0.07	0.19	0.07
	0.0-0.2	0.19	0.06	0.19	0.07	0.20	0.07	0.0-0.2	0.20	0.07	0.19	0.07
Fv	0.8-1.0	0.57	0.09	0.56	0.10	0.61	0.11	0.8-1.0	0.64	0.08	0.55	0.11
	0.6-0.8	0.58	0.10	0.58	0.10	0.60	0.10	0.6-0.8	0.61	0.10	0.59	0.10
	0.4-0.6	0.60	0.10	0.60	0.09	0.60	0.10	0.4-0.6	0.61	0.10	0.61	0.09
	0.2-0.4	0.61	0.09	0.61	0.09	0.61	0.09	0.2-0.4	0.61	0.09	0.61	0.09
	0.0-0.2	0.62	0.08	0.61	0.08	0.61	0.08	0.0-0.2	0.61	0.08	0.61	0.08

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-3. SC Chip 3: Dense Mountain Peaks

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	12204	100%	12204	100%	12204	100%	0.0-1.0	12204	100%	12204	100%
N_5	0.8-1.0	7	0%	3	0%	4	0%	0.8-1.0	3	0%	11	0%
N_4	0.6-0.8	324	3%	277	2%	452	4%	0.6-0.8	352	3%	411	3%
N_3	0.4-0.6	1902	16%	1906	16%	2744	22%	0.4-0.6	2046	17%	2502	21%
N_2	0.2-0.4	5307	43%	5269	43%	5672	46%	0.2-0.4	5197	43%	5473	45%
N_1	0.0-0.2	4664	38%	4749	39%	3332	27%	0.0-0.2	4606	38%	3807	31%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.74	0.03	0.75	0.02	0.73	0.02	0.8-1.0	0.74	0.03	0.75	0.02
	0.6-0.8	0.75	0.02	0.75	0.02	0.75	0.02	0.6-0.8	0.75	0.02	0.75	0.03
	0.4-0.6	0.75	0.03	0.75	0.03	0.75	0.02	0.4-0.6	0.75	0.02	0.75	0.03
	0.2-0.4	0.75	0.03	0.75	0.03	0.75	0.03	0.2-0.4	0.75	0.03	0.75	0.03
	0.0-0.2	0.75	0.03	0.75	0.03	0.75	0.03	0.0-0.2	0.76	0.03	0.75	0.03
A	0.8-1.0	43.04	2.61	43.42	1.11	41.97	3.05	0.8-1.0	42.13	3.69	45.95	3.36
	0.6-0.8	43.89	2.49	43.80	2.67	44.11	2.17	0.6-0.8	44.06	2.19	44.09	2.52
	0.4-0.6	44.03	2.38	44.10	2.40	44.09	2.33	0.4-0.6	44.06	2.33	44.17	2.32
	0.2-0.4	44.04	2.30	44.09	2.30	44.02	2.34	0.2-0.4	43.99	2.33	44.01	2.33
	0.0-0.2	43.99	2.34	43.90	2.32	43.91	2.33	0.0-0.2	44.01	2.34	43.90	2.31
Fd	0.8-1.0	0.08	0.06	0.03	0.01	0.10	0.04	0.8-1.0	0.07	0.04	0.13	0.05
	0.6-0.8	0.08	0.04	0.08	0.04	0.09	0.04	0.6-0.8	0.09	0.04	0.09	0.04
	0.4-0.6	0.08	0.04	0.09	0.04	0.09	0.04	0.4-0.6	0.08	0.04	0.08	0.04
	0.2-0.4	0.08	0.04	0.09	0.04	0.08	0.04	0.2-0.4	0.09	0.04	0.09	0.04
	0.0-0.2	0.08	0.04	0.08	0.04	0.08	0.04	0.0-0.2	0.08	0.04	0.08	0.04
Fs	0.8-1.0	0.23	0.07	0.17	0.04	0.23	0.08	0.8-1.0	0.23	0.13	0.16	0.04
	0.6-0.8	0.20	0.06	0.20	0.06	0.19	0.05	0.6-0.8	0.19	0.05	0.20	0.05
	0.4-0.6	0.19	0.05	0.19	0.05	0.19	0.05	0.4-0.6	0.19	0.05	0.19	0.05
	0.2-0.4	0.19	0.05	0.19	0.05	0.19	0.05	0.2-0.4	0.19	0.05	0.19	0.05
	0.0-0.2	0.19	0.05	0.19	0.05	0.19	0.05	0.0-0.2	0.19	0.05	0.20	0.05
Fv	0.8-1.0	0.69	0.06	0.80	0.04	0.67	0.04	0.8-1.0	0.69	0.09	0.72	0.05
	0.6-0.8	0.72	0.05	0.72	0.05	0.72	0.05	0.6-0.8	0.72	0.05	0.72	0.05
	0.4-0.6	0.72	0.05	0.72	0.05	0.72	0.05	0.4-0.6	0.72	0.05	0.72	0.05
	0.2-0.4	0.72	0.05	0.72	0.05	0.72	0.05	0.2-0.4	0.72	0.05	0.72	0.05
	0.0-0.2	0.72	0.05	0.72	0.05	0.72	0.05	0.0-0.2	0.72	0.05	0.72	0.05

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-4. SC Chip 4: Hollywood Forever Memorial Park

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14040	100%	14040	100%	14040	100%	0.0-1.0	14040	100%	14040	100%
N_5	0.8-1.0	33	0%	32	0%	35	0%	0.8-1.0	30	0%	51	0%
N_4	0.6-0.8	959	7%	702	5%	1027	7%	0.6-0.8	589	4%	946	7%
N_3	0.4-0.6	3473	25%	3204	23%	3783	27%	0.4-0.6	2969	21%	3778	27%
N_2	0.2-0.4	6106	43%	6164	44%	5949	42%	0.2-0.4	6188	44%	6017	43%
N_1	0.0-0.2	3469	25%	3938	28%	3246	23%	0.0-0.2	4264	30%	3248	23%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.48	0.07	0.48	0.09	0.48	0.07	0.8-1.0	0.48	0.07	0.51	0.10
	0.6-0.8	0.49	0.09	0.50	0.10	0.49	0.09	0.6-0.8	0.49	0.09	0.49	0.09
	0.4-0.6	0.50	0.10	0.52	0.10	0.51	0.10	0.4-0.6	0.51	0.10	0.51	0.11
	0.2-0.4	0.53	0.11	0.52	0.11	0.52	0.11	0.2-0.4	0.52	0.11	0.53	0.11
	0.0-0.2	0.54	0.11	0.53	0.11	0.53	0.11	0.0-0.2	0.53	0.11	0.53	0.11
A	0.8-1.0	49.36	3.21	51.44	4.81	48.07	4.01	0.8-1.0	49.01	3.67	49.92	2.70
	0.6-0.8	49.58	4.46	49.59	5.06	49.46	4.44	0.6-0.8	49.28	4.60	49.55	4.25
	0.4-0.6	49.06	4.48	48.75	4.72	48.85	4.45	0.4-0.6	49.16	4.63	48.95	4.30
	0.2-0.4	48.59	4.51	48.64	4.45	48.61	4.57	0.2-0.4	48.63	4.43	48.54	4.58
	0.0-0.2	48.13	4.34	48.43	4.15	48.27	4.28	0.0-0.2	48.26	4.36	48.26	4.48
Fd	0.8-1.0	0.52	0.10	0.58	0.14	0.51	0.11	0.8-1.0	0.50	0.13	0.52	0.12
	0.6-0.8	0.54	0.14	0.52	0.15	0.53	0.14	0.6-0.8	0.52	0.15	0.53	0.14
	0.4-0.6	0.51	0.16	0.49	0.16	0.50	0.16	0.4-0.6	0.51	0.16	0.51	0.16
	0.2-0.4	0.48	0.16	0.49	0.16	0.49	0.17	0.2-0.4	0.49	0.16	0.48	0.16
	0.0-0.2	0.46	0.16	0.48	0.16	0.47	0.16	0.0-0.2	0.47	0.17	0.47	0.16
Fs	0.8-1.0	0.27	0.09	0.27	0.09	0.30	0.10	0.8-1.0	0.29	0.09	0.25	0.08
	0.6-0.8	0.26	0.10	0.28	0.11	0.27	0.10	0.6-0.8	0.27	0.10	0.27	0.09
	0.4-0.6	0.27	0.10	0.28	0.10	0.28	0.10	0.4-0.6	0.27	0.10	0.27	0.10
	0.2-0.4	0.28	0.10	0.28	0.10	0.28	0.10	0.2-0.4	0.28	0.10	0.28	0.10
	0.0-0.2	0.28	0.10	0.28	0.10	0.28	0.10	0.0-0.2	0.28	0.10	0.28	0.10
Fv	0.8-1.0	0.21	0.09	0.15	0.09	0.19	0.07	0.8-1.0	0.22	0.07	0.23	0.12
	0.6-0.8	0.20	0.11	0.20	0.12	0.20	0.11	0.6-0.8	0.21	0.11	0.20	0.11
	0.4-0.6	0.22	0.13	0.23	0.14	0.22	0.14	0.4-0.6	0.22	0.14	0.22	0.14
	0.2-0.4	0.24	0.15	0.24	0.15	0.24	0.15	0.2-0.4	0.23	0.15	0.24	0.15
	0.0-0.2	0.25	0.16	0.24	0.16	0.25	0.16	0.0-0.2	0.25	0.16	0.25	0.16

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-5. SC Chip 5: Los Angeles Memorial Coliseum

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15228	100%	15228	100%	15228	100%	0.0-1.0	15228	100%	15228	100%
N_5	0.8-1.0	109	1%	48	0%	80	1%	0.8-1.0	48	0%	132	1%
N_4	0.6-0.8	1302	9%	854	6%	1359	9%	0.6-0.8	668	4%	1483	10%
N_3	0.4-0.6	3876	25%	3343	22%	4017	26%	0.4-0.6	3060	20%	4112	27%
N_2	0.2-0.4	6401	42%	6737	44%	6407	42%	0.2-0.4	6687	44%	6198	41%
N_1	0.0-0.2	3540	23%	4246	28%	3365	22%	0.0-0.2	4765	31%	3303	22%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.54	0.08	0.53	0.08	0.49	0.08	0.8-1.0	0.52	0.14	0.52	0.08
	0.6-0.8	0.55	0.11	0.56	0.11	0.54	0.11	0.6-0.8	0.54	0.13	0.55	0.12
	0.4-0.6	0.58	0.12	0.59	0.13	0.58	0.12	0.4-0.6	0.58	0.12	0.58	0.12
	0.2-0.4	0.60	0.12	0.60	0.12	0.60	0.12	0.2-0.4	0.60	0.12	0.60	0.12
	0.0-0.2	0.62	0.12	0.61	0.12	0.62	0.12	0.0-0.2	0.62	0.12	0.62	0.12
A	0.8-1.0	44.72	3.67	44.90	4.58	43.78	4.58	0.8-1.0	44.41	6.97	43.96	4.22
	0.6-0.8	44.21	4.66	44.26	5.00	43.99	4.69	0.6-0.8	44.23	5.41	44.27	4.71
	0.4-0.6	44.44	4.80	44.66	5.17	44.38	4.88	0.4-0.6	44.53	4.90	44.60	4.74
	0.2-0.4	44.71	4.85	44.68	4.80	44.82	4.84	0.2-0.4	44.64	4.78	44.68	4.91
	0.0-0.2	45.22	4.86	44.91	4.55	45.23	4.74	0.0-0.2	45.01	4.72	45.17	4.84
Fd	0.8-1.0	0.28	0.10	0.33	0.12	0.30	0.12	0.8-1.0	0.25	0.14	0.28	0.10
	0.6-0.8	0.25	0.10	0.26	0.11	0.25	0.10	0.6-0.8	0.24	0.12	0.25	0.10
	0.4-0.6	0.23	0.09	0.24	0.10	0.23	0.10	0.4-0.6	0.24	0.10	0.23	0.10
	0.2-0.4	0.23	0.09	0.23	0.09	0.23	0.09	0.2-0.4	0.23	0.09	0.23	0.09
	0.0-0.2	0.23	0.09	0.23	0.09	0.23	0.09	0.0-0.2	0.23	0.09	0.23	0.09
Fs	0.8-1.0	0.36	0.13	0.39	0.13	0.41	0.14	0.8-1.0	0.35	0.21	0.39	0.14
	0.6-0.8	0.38	0.15	0.37	0.17	0.39	0.16	0.6-0.8	0.37	0.17	0.37	0.16
	0.4-0.6	0.36	0.17	0.34	0.17	0.35	0.17	0.4-0.6	0.35	0.17	0.35	0.17
	0.2-0.4	0.34	0.17	0.34	0.17	0.33	0.17	0.2-0.4	0.34	0.17	0.33	0.17
	0.0-0.2	0.31	0.17	0.33	0.16	0.32	0.17	0.0-0.2	0.32	0.16	0.32	0.17
Fv	0.8-1.0	0.35	0.12	0.28	0.13	0.28	0.11	0.8-1.0	0.37	0.21	0.33	0.13
	0.6-0.8	0.36	0.15	0.37	0.17	0.36	0.15	0.6-0.8	0.38	0.18	0.37	0.16
	0.4-0.6	0.41	0.17	0.41	0.18	0.41	0.17	0.4-0.6	0.41	0.18	0.41	0.17
	0.2-0.4	0.43	0.18	0.42	0.18	0.43	0.18	0.2-0.4	0.42	0.17	0.43	0.18
	0.0-0.2	0.45	0.18	0.44	0.17	0.45	0.18	0.0-0.2	0.44	0.17	0.45	0.18

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-6. SC Chip 6: Rosedale Cemetery

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15012	100%	15012	100%	15012	100%	0.0-1.0	15012	100%	15012	100%
N_5	0.8-1.0	54	0%	33	0%	91	1%	0.8-1.0	40	0%	96	1%
N_4	0.6-0.8	958	6%	727	5%	1158	8%	0.6-0.8	665	4%	1228	8%
N_3	0.4-0.6	3645	24%	3185	21%	4021	27%	0.4-0.6	3085	21%	4043	27%
N_2	0.2-0.4	6580	44%	6617	44%	6496	43%	0.2-0.4	6691	45%	6345	42%
N_1	0.0-0.2	3775	25%	4450	30%	3246	22%	0.0-0.2	4531	30%	3300	22%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.50	0.07	0.60	0.09	0.54	0.09	0.8-1.0	0.55	0.09	0.52	0.09
	0.6-0.8	0.53	0.10	0.55	0.11	0.54	0.10	0.6-0.8	0.58	0.12	0.55	0.10
	0.4-0.6	0.57	0.12	0.57	0.11	0.58	0.12	0.4-0.6	0.58	0.12	0.58	0.12
	0.2-0.4	0.60	0.12	0.59	0.12	0.60	0.12	0.2-0.4	0.59	0.12	0.60	0.12
	0.0-0.2	0.61	0.12	0.60	0.12	0.61	0.12	0.0-0.2	0.59	0.12	0.61	0.12
A	0.8-1.0	44.85	3.49	46.22	4.32	45.51	3.89	0.8-1.0	47.38	4.55	44.56	3.56
	0.6-0.8	44.17	3.49	43.86	3.81	44.09	3.41	0.6-0.8	44.51	3.48	44.22	3.38
	0.4-0.6	44.27	3.38	44.01	3.38	44.25	3.30	0.4-0.6	44.18	3.44	44.16	3.32
	0.2-0.4	44.20	3.31	44.25	3.25	44.19	3.28	0.2-0.4	44.25	3.28	44.31	3.28
	0.0-0.2	44.17	3.25	44.35	3.29	44.23	3.39	0.0-0.2	44.11	3.26	44.08	3.38
Fd	0.8-1.0	0.36	0.14	0.31	0.12	0.33	0.12	0.8-1.0	0.30	0.09	0.33	0.13
	0.6-0.8	0.32	0.11	0.31	0.12	0.31	0.11	0.6-0.8	0.28	0.11	0.31	0.11
	0.4-0.6	0.29	0.11	0.29	0.11	0.29	0.11	0.4-0.6	0.28	0.11	0.28	0.11
	0.2-0.4	0.27	0.11	0.28	0.11	0.27	0.11	0.2-0.4	0.28	0.11	0.27	0.11
	0.0-0.2	0.26	0.11	0.27	0.11	0.26	0.11	0.0-0.2	0.28	0.11	0.26	0.11
Fs	0.8-1.0	0.38	0.11	0.30	0.09	0.35	0.13	0.8-1.0	0.32	0.16	0.39	0.11
	0.6-0.8	0.38	0.12	0.38	0.13	0.38	0.12	0.6-0.8	0.35	0.13	0.38	0.12
	0.4-0.6	0.36	0.13	0.37	0.13	0.36	0.13	0.4-0.6	0.36	0.13	0.36	0.13
	0.2-0.4	0.35	0.13	0.35	0.13	0.35	0.13	0.2-0.4	0.35	0.13	0.34	0.13
	0.0-0.2	0.34	0.13	0.34	0.13	0.34	0.13	0.0-0.2	0.35	0.13	0.34	0.14
Fv	0.8-1.0	0.26	0.08	0.39	0.15	0.31	0.15	0.8-1.0	0.38	0.16	0.28	0.12
	0.6-0.8	0.29	0.14	0.31	0.16	0.31	0.15	0.6-0.8	0.38	0.18	0.31	0.15
	0.4-0.6	0.35	0.17	0.35	0.17	0.35	0.17	0.4-0.6	0.36	0.17	0.36	0.18
	0.2-0.4	0.38	0.18	0.38	0.18	0.38	0.18	0.2-0.4	0.37	0.18	0.38	0.18
	0.0-0.2	0.40	0.18	0.40	0.18	0.40	0.18	0.0-0.2	0.37	0.18	0.39	0.18

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-7. SC Chip 7: High Density Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14472	100%	14472	100%	14472	100%	0.0-1.0	14472	100%	14472	100%
N_5	0.8-1.0	73	1%	52	0%	107	1%	0.8-1.0	48	0%	84	1%
N_4	0.6-0.8	1086	8%	863	6%	1296	9%	0.6-0.8	663	5%	1315	9%
N_3	0.4-0.6	4021	28%	3283	23%	4349	30%	0.4-0.6	3058	21%	4257	29%
N_2	0.2-0.4	6016	42%	6344	44%	5822	40%	0.2-0.4	6400	44%	5835	40%
N_1	0.0-0.2	3276	23%	3930	27%	2898	20%	0.0-0.2	4303	30%	2981	21%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.48	0.07	0.50	0.08	0.47	0.07	0.8-1.0	0.48	0.07	0.48	0.07
	0.6-0.8	0.48	0.08	0.49	0.09	0.49	0.08	0.6-0.8	0.49	0.09	0.49	0.08
	0.4-0.6	0.50	0.09	0.50	0.09	0.50	0.09	0.4-0.6	0.50	0.09	0.50	0.09
	0.2-0.4	0.51	0.09	0.51	0.09	0.51	0.09	0.2-0.4	0.51	0.09	0.51	0.09
	0.0-0.2	0.51	0.09	0.51	0.09	0.51	0.09	0.0-0.2	0.51	0.09	0.51	0.09
A	0.8-1.0	46.58	2.29	46.09	3.03	46.39	2.56	0.8-1.0	47.03	3.02	46.85	2.24
	0.6-0.8	46.02	3.10	45.68	3.48	45.63	3.12	0.6-0.8	46.07	3.08	45.65	3.03
	0.4-0.6	45.47	3.20	45.64	3.13	45.42	3.20	0.4-0.6	45.74	3.16	45.57	3.17
	0.2-0.4	45.37	3.09	45.38	3.08	45.33	3.10	0.2-0.4	45.35	3.15	45.26	3.16
	0.0-0.2	45.19	3.14	45.20	3.15	45.42	3.14	0.0-0.2	45.16	3.08	45.34	3.09
Fd	0.8-1.0	0.47	0.08	0.44	0.11	0.48	0.09	0.8-1.0	0.47	0.10	0.47	0.08
	0.6-0.8	0.45	0.12	0.44	0.13	0.44	0.12	0.6-0.8	0.45	0.13	0.44	0.12
	0.4-0.6	0.43	0.13	0.43	0.12	0.43	0.13	0.4-0.6	0.44	0.13	0.43	0.13
	0.2-0.4	0.42	0.12	0.42	0.12	0.42	0.12	0.2-0.4	0.42	0.12	0.42	0.12
	0.0-0.2	0.42	0.12	0.42	0.13	0.42	0.13	0.0-0.2	0.42	0.12	0.42	0.12
Fs	0.8-1.0	0.32	0.07	0.34	0.07	0.34	0.08	0.8-1.0	0.33	0.08	0.32	0.07
	0.6-0.8	0.35	0.10	0.37	0.10	0.36	0.10	0.6-0.8	0.34	0.09	0.36	0.10
	0.4-0.6	0.36	0.10	0.36	0.10	0.36	0.10	0.4-0.6	0.36	0.10	0.36	0.10
	0.2-0.4	0.36	0.09	0.36	0.10	0.36	0.09	0.2-0.4	0.36	0.10	0.37	0.10
	0.0-0.2	0.36	0.09	0.36	0.09	0.36	0.09	0.0-0.2	0.36	0.09	0.36	0.09
Fv	0.8-1.0	0.21	0.08	0.22	0.10	0.18	0.07	0.8-1.0	0.20	0.08	0.20	0.08
	0.6-0.8	0.20	0.09	0.19	0.09	0.21	0.09	0.6-0.8	0.21	0.10	0.20	0.09
	0.4-0.6	0.21	0.10	0.21	0.10	0.21	0.10	0.4-0.6	0.21	0.10	0.21	0.10
	0.2-0.4	0.21	0.10	0.21	0.10	0.21	0.10	0.2-0.4	0.21	0.10	0.22	0.10
	0.0-0.2	0.22	0.10	0.22	0.10	0.22	0.11	0.0-0.2	0.22	0.10	0.22	0.10

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-8. SC Chip 8: Lake

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	12744	100%	12744	100%	12744	100%	0.0-1.0	12744	100%	12744	100%
N_5	0.8-1.0	45	0%	26	0%	49	0%	0.8-1.0	11	0%	56	0%
N_4	0.6-0.8	515	4%	466	4%	770	6%	0.6-0.8	414	3%	683	5%
N_3	0.4-0.6	2420	19%	2293	18%	3087	24%	0.4-0.6	2274	18%	2850	22%
N_2	0.2-0.4	5565	44%	5523	43%	5715	45%	0.2-0.4	5781	45%	5597	44%
N_1	0.0-0.2	4199	33%	4436	35%	3123	25%	0.0-0.2	4264	33%	3558	28%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.70	0.05	0.67	0.08	0.70	0.04	0.8-1.0	0.74	0.04	0.70	0.05
	0.6-0.8	0.72	0.07	0.72	0.07	0.73	0.06	0.6-0.8	0.74	0.05	0.73	0.06
	0.4-0.6	0.73	0.06	0.73	0.06	0.74	0.06	0.4-0.6	0.74	0.05	0.74	0.06
	0.2-0.4	0.74	0.05	0.74	0.05	0.74	0.05	0.2-0.4	0.74	0.05	0.74	0.05
	0.0-0.2	0.74	0.05	0.74	0.05	0.74	0.05	0.0-0.2	0.74	0.05	0.74	0.05
A	0.8-1.0	48.63	3.36	49.78	4.18	49.37	2.94	0.8-1.0	44.97	2.33	48.98	2.66
	0.6-0.8	46.73	4.15	47.44	4.02	46.82	3.90	0.6-0.8	46.53	3.71	47.17	3.99
	0.4-0.6	46.20	3.88	46.49	4.10	46.14	3.85	0.4-0.6	46.23	3.89	46.16	3.79
	0.2-0.4	46.01	3.75	45.96	3.65	45.91	3.75	0.2-0.4	45.98	3.72	45.96	3.71
	0.0-0.2	45.81	3.50	45.68	3.49	45.84	3.44	0.0-0.2	45.90	3.62	45.73	3.57
Fd	0.8-1.0	0.28	0.12	0.33	0.14	0.28	0.11	0.8-1.0	0.14	0.08	0.26	0.11
	0.6-0.8	0.18	0.13	0.20	0.13	0.18	0.12	0.6-0.8	0.16	0.10	0.19	0.12
	0.4-0.6	0.16	0.10	0.17	0.11	0.16	0.10	0.4-0.6	0.16	0.10	0.16	0.10
	0.2-0.4	0.15	0.09	0.15	0.09	0.15	0.09	0.2-0.4	0.15	0.09	0.15	0.09
	0.0-0.2	0.15	0.09	0.14	0.08	0.15	0.09	0.0-0.2	0.15	0.09	0.14	0.09
Fs	0.8-1.0	0.20	0.05	0.18	0.05	0.19	0.05	0.8-1.0	0.22	0.08	0.18	0.05
	0.6-0.8	0.19	0.07	0.18	0.06	0.19	0.07	0.6-0.8	0.18	0.06	0.19	0.07
	0.4-0.6	0.19	0.08	0.19	0.08	0.20	0.08	0.4-0.6	0.19	0.07	0.20	0.08
	0.2-0.4	0.20	0.08	0.20	0.08	0.20	0.08	0.2-0.4	0.20	0.08	0.20	0.08
	0.0-0.2	0.20	0.08	0.20	0.08	0.20	0.08	0.0-0.2	0.20	0.08	0.20	0.08
Fv	0.8-1.0	0.52	0.12	0.50	0.13	0.53	0.11	0.8-1.0	0.65	0.08	0.56	0.13
	0.6-0.8	0.63	0.13	0.62	0.13	0.63	0.12	0.6-0.8	0.66	0.10	0.62	0.12
	0.4-0.6	0.65	0.11	0.63	0.11	0.65	0.11	0.4-0.6	0.65	0.10	0.64	0.11
	0.2-0.4	0.65	0.10	0.65	0.10	0.65	0.10	0.2-0.4	0.65	0.10	0.65	0.10
	0.0-0.2	0.66	0.10	0.66	0.09	0.65	0.09	0.0-0.2	0.65	0.10	0.66	0.10

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-9. SC Chip 9: Near-Range Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	8856	100%	8856	100%	8856	100%	0.0-1.0	8856	100%	8856	100%
N_5	0.8-1.0	9	0%	6	0%	10	0%	0.8-1.0	3	0%	17	0%
N_4	0.6-0.8	318	4%	343	4%	468	5%	0.6-0.8	255	3%	407	5%
N_3	0.4-0.6	1549	17%	1614	18%	2026	23%	0.4-0.6	1580	18%	2108	24%
N_2	0.2-0.4	3868	44%	3762	42%	4002	45%	0.2-0.4	3932	44%	3971	45%
N_1	0.0-0.2	3112	35%	3131	35%	2350	27%	0.0-0.2	3086	35%	2353	27%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.71	0.04	0.73	0.04	0.74	0.04	0.8-1.0	0.64	0.10	0.72	0.04
	0.6-0.8	0.72	0.05	0.72	0.05	0.73	0.04	0.6-0.8	0.72	0.06	0.73	0.05
	0.4-0.6	0.73	0.05	0.73	0.05	0.73	0.05	0.4-0.6	0.73	0.04	0.73	0.05
	0.2-0.4	0.73	0.04	0.74	0.04	0.74	0.04	0.2-0.4	0.73	0.04	0.73	0.04
	0.0-0.2	0.74	0.04	0.74	0.04	0.74	0.04	0.0-0.2	0.74	0.04	0.74	0.04
A	0.8-1.0	46.83	1.54	44.23	4.69	46.93	3.65	0.8-1.0	52.51	5.50	44.96	3.37
	0.6-0.8	45.99	4.29	45.90	4.61	46.33	3.58	0.6-0.8	47.18	4.54	46.29	4.13
	0.4-0.6	46.02	4.10	46.02	4.25	46.01	3.98	0.4-0.6	46.07	3.74	46.08	3.93
	0.2-0.4	45.85	3.77	45.90	3.67	45.75	3.76	0.2-0.4	45.82	3.81	45.83	3.69
	0.0-0.2	45.67	3.52	45.63	3.49	45.68	3.60	0.0-0.2	45.58	3.60	45.51	3.64
Fd	0.8-1.0	0.22	0.04	0.16	0.11	0.21	0.06	0.8-1.0	0.30	0.10	0.15	0.07
	0.6-0.8	0.17	0.09	0.18	0.10	0.18	0.07	0.6-0.8	0.20	0.10	0.18	0.08
	0.4-0.6	0.17	0.08	0.18	0.08	0.18	0.08	0.4-0.6	0.18	0.08	0.17	0.08
	0.2-0.4	0.17	0.07	0.17	0.07	0.17	0.08	0.2-0.4	0.17	0.08	0.17	0.08
	0.0-0.2	0.17	0.07	0.16	0.07	0.16	0.07	0.0-0.2	0.16	0.07	0.16	0.07
Fs	0.8-1.0	0.18	0.04	0.21	0.11	0.19	0.07	0.8-1.0	0.14	0.05	0.21	0.07
	0.6-0.8	0.21	0.07	0.21	0.07	0.19	0.07	0.6-0.8	0.19	0.07	0.20	0.07
	0.4-0.6	0.20	0.07	0.20	0.07	0.20	0.07	0.4-0.6	0.20	0.07	0.20	0.07
	0.2-0.4	0.20	0.07	0.20	0.07	0.20	0.07	0.2-0.4	0.20	0.07	0.20	0.07
	0.0-0.2	0.20	0.07	0.20	0.07	0.20	0.07	0.0-0.2	0.20	0.07	0.20	0.07
Fv	0.8-1.0	0.60	0.04	0.63	0.09	0.61	0.06	0.8-1.0	0.55	0.04	0.64	0.07
	0.6-0.8	0.62	0.08	0.61	0.07	0.63	0.07	0.6-0.8	0.61	0.08	0.62	0.07
	0.4-0.6	0.63	0.07	0.62	0.07	0.62	0.07	0.4-0.6	0.63	0.07	0.63	0.07
	0.2-0.4	0.63	0.07	0.63	0.07	0.63	0.07	0.2-0.4	0.63	0.07	0.63	0.07
	0.0-0.2	0.63	0.06	0.64	0.06	0.64	0.06	0.0-0.2	0.64	0.06	0.63	0.06

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-10. SC Chip 10: Dense Mountain Peaks

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	11448	100%	11448	100%	11448	100%	0.0-1.0	11448	100%	11448	100%
N_5	0.8-1.0	0	0%	3	0%	9	0%	0.8-1.0	13	0%	6	0%
N_4	0.6-0.8	293	3%	346	3%	453	4%	0.6-0.8	356	3%	360	3%
N_3	0.4-0.6	1992	17%	2017	18%	2492	22%	0.4-0.6	2040	18%	2271	20%
N_2	0.2-0.4	4976	43%	4822	42%	5182	45%	0.2-0.4	4933	43%	5255	46%
N_1	0.0-0.2	4187	37%	4260	37%	3312	29%	0.0-0.2	4106	36%	3556	31%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	—	—	0.75	0.05	0.75	0.03	0.8-1.0	0.74	0.03	0.72	0.06
	0.6-0.8	0.75	0.03	0.75	0.04	0.75	0.04	0.6-0.8	0.75	0.04	0.75	0.04
	0.4-0.6	0.75	0.04	0.75	0.04	0.75	0.04	0.4-0.6	0.75	0.04	0.75	0.04
	0.2-0.4	0.75	0.04	0.75	0.04	0.75	0.04	0.2-0.4	0.75	0.04	0.75	0.04
	0.0-0.2	0.75	0.04	0.75	0.04	0.75	0.04	0.0-0.2	0.75	0.04	0.75	0.04
A	0.8-1.0	—	—	43.26	1.67	43.89	2.84	0.8-1.0	42.89	2.44	42.53	6.03
	0.6-0.8	43.20	2.81	43.15	3.45	43.73	3.23	0.6-0.8	43.69	3.61	43.31	3.43
	0.4-0.6	43.23	3.55	43.38	3.59	43.31	3.51	0.4-0.6	43.25	3.64	43.27	3.53
	0.2-0.4	43.17	3.63	43.03	3.65	43.07	3.59	0.2-0.4	43.07	3.69	43.05	3.63
	0.0-0.2	42.83	3.74	42.93	3.66	42.74	3.84	0.0-0.2	42.88	3.58	42.89	3.74
Fd	0.8-1.0	—	—	0.07	0.02	0.09	0.02	0.8-1.0	0.08	0.03	0.12	0.09
	0.6-0.8	0.08	0.05	0.09	0.06	0.09	0.05	0.6-0.8	0.10	0.07	0.09	0.05
	0.4-0.6	0.09	0.06	0.09	0.06	0.09	0.06	0.4-0.6	0.09	0.06	0.09	0.06
	0.2-0.4	0.09	0.06	0.09	0.05	0.09	0.06	0.2-0.4	0.09	0.06	0.09	0.06
	0.0-0.2	0.09	0.05	0.09	0.05	0.09	0.05	0.0-0.2	0.09	0.05	0.09	0.05
Fs	0.8-1.0	—	—	0.22	0.10	0.21	0.06	0.8-1.0	0.22	0.06	0.25	0.14
	0.6-0.8	0.21	0.06	0.22	0.07	0.20	0.06	0.6-0.8	0.20	0.07	0.21	0.07
	0.4-0.6	0.21	0.07	0.21	0.07	0.21	0.07	0.4-0.6	0.21	0.07	0.21	0.07
	0.2-0.4	0.21	0.07	0.22	0.07	0.21	0.07	0.2-0.4	0.21	0.08	0.22	0.07
	0.0-0.2	0.22	0.08	0.22	0.07	0.22	0.08	0.0-0.2	0.22	0.07	0.22	0.08
Fv	0.8-1.0	—	—	0.70	0.12	0.70	0.05	0.8-1.0	0.70	0.05	0.63	0.10
	0.6-0.8	0.71	0.07	0.69	0.07	0.71	0.06	0.6-0.8	0.70	0.07	0.70	0.07
	0.4-0.6	0.70	0.07	0.70	0.07	0.70	0.07	0.4-0.6	0.69	0.06	0.70	0.07
	0.2-0.4	0.70	0.07	0.70	0.07	0.70	0.07	0.2-0.4	0.70	0.07	0.70	0.06
	0.0-0.2	0.69	0.07	0.70	0.07	0.69	0.07	0.0-0.2	0.70	0.07	0.69	0.07

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-11. SC Chip 11: Near-Range Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	7776	100%	7776	100%	7776	100%	0.0-1.0	7776	100%	7776	100%
N_5	0.8-1.0	2	0%	9	0%	2	0%	0.8-1.0	3	0%	16	0%
N_4	0.6-0.8	228	3%	277	4%	319	4%	0.6-0.8	290	4%	393	5%
N_3	0.4-0.6	1344	17%	1462	19%	1786	23%	0.4-0.6	1480	19%	1762	23%
N_2	0.2-0.4	3463	45%	3304	42%	3542	46%	0.2-0.4	3333	43%	3452	44%
N_1	0.0-0.2	2739	35%	2724	35%	2127	27%	0.0-0.2	2670	34%	2153	28%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.70	0.05	0.71	0.05	0.76	0.00	0.8-1.0	0.74	0.05	0.73	0.05
	0.6-0.8	0.72	0.05	0.73	0.05	0.73	0.04	0.6-0.8	0.73	0.04	0.73	0.05
	0.4-0.6	0.73	0.05	0.73	0.05	0.73	0.04	0.4-0.6	0.74	0.04	0.73	0.05
	0.2-0.4	0.74	0.04	0.74	0.04	0.74	0.04	0.2-0.4	0.73	0.04	0.74	0.04
	0.0-0.2	0.74	0.04	0.74	0.04	0.74	0.04	0.0-0.2	0.74	0.04	0.74	0.04
A	0.8-1.0	48.05	0.46	46.92	4.33	45.88	0.55	0.8-1.0	43.75	3.92	46.70	3.93
	0.6-0.8	45.38	4.08	45.33	4.34	45.36	3.60	0.6-0.8	45.14	3.89	45.18	3.58
	0.4-0.6	44.54	3.68	44.37	3.61	44.80	3.60	0.4-0.6	44.60	3.43	44.60	3.53
	0.2-0.4	44.49	3.48	44.48	3.49	44.39	3.44	0.2-0.4	44.38	3.47	44.46	3.47
	0.0-0.2	44.34	3.30	44.43	3.28	44.20	3.39	0.0-0.2	44.45	3.46	44.24	3.41
Fd	0.8-1.0	0.24	0.04	0.14	0.13	0.06	0.03	0.8-1.0	0.08	0.00	0.14	0.08
	0.6-0.8	0.11	0.09	0.11	0.09	0.10	0.07	0.6-0.8	0.11	0.07	0.11	0.07
	0.4-0.6	0.10	0.07	0.10	0.07	0.10	0.07	0.4-0.6	0.09	0.06	0.10	0.07
	0.2-0.4	0.09	0.06	0.09	0.06	0.09	0.06	0.2-0.4	0.09	0.06	0.09	0.06
	0.0-0.2	0.09	0.06	0.09	0.06	0.09	0.06	0.0-0.2	0.09	0.06	0.09	0.06
Fs	0.8-1.0	0.17	0.02	0.17	0.04	0.14	0.02	0.8-1.0	0.19	0.04	0.16	0.02
	0.6-0.8	0.17	0.06	0.17	0.07	0.17	0.06	0.6-0.8	0.17	0.06	0.18	0.06
	0.4-0.6	0.18	0.07	0.18	0.07	0.18	0.06	0.4-0.6	0.18	0.06	0.18	0.07
	0.2-0.4	0.18	0.06	0.18	0.06	0.18	0.06	0.2-0.4	0.18	0.07	0.18	0.06
	0.0-0.2	0.18	0.06	0.18	0.06	0.18	0.07	0.0-0.2	0.18	0.06	0.18	0.06
Fv	0.8-1.0	0.59	0.06	0.69	0.10	0.79	0.05	0.8-1.0	0.73	0.04	0.70	0.08
	0.6-0.8	0.71	0.09	0.72	0.10	0.73	0.08	0.6-0.8	0.72	0.09	0.72	0.08
	0.4-0.6	0.72	0.09	0.72	0.09	0.72	0.08	0.4-0.6	0.73	0.08	0.72	0.09
	0.2-0.4	0.73	0.08	0.73	0.08	0.73	0.08	0.2-0.4	0.73	0.08	0.73	0.08
	0.0-0.2	0.73	0.07	0.73	0.08	0.74	0.08	0.0-0.2	0.73	0.08	0.73	0.08

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-12. SC Chip 12: Residential + Mountain Base

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	13392	100%	13392	100%	13392	100%	0.0-1.0	13392	100%	13392	100%
N_5	0.8-1.0	40	0%	57	0%	85	1%	0.8-1.0	36	0%	62	0%
N_4	0.6-0.8	897	7%	797	6%	1209	9%	0.6-0.8	592	4%	1200	9%
N_3	0.4-0.6	3182	24%	3034	23%	3720	28%	0.4-0.6	2756	21%	3458	26%
N_2	0.2-0.4	5732	43%	5734	43%	5481	41%	0.2-0.4	5875	44%	5576	42%
N_1	0.0-0.2	3541	26%	3770	28%	2897	22%	0.0-0.2	4133	31%	3096	23%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.50	0.09	0.53	0.09	0.55	0.08	0.8-1.0	0.51	0.12	0.53	0.09
	0.6-0.8	0.54	0.10	0.55	0.10	0.56	0.10	0.6-0.8	0.57	0.11	0.56	0.10
	0.4-0.6	0.57	0.11	0.57	0.11	0.58	0.11	0.4-0.6	0.58	0.11	0.58	0.11
	0.2-0.4	0.59	0.11	0.59	0.11	0.59	0.11	0.2-0.4	0.59	0.11	0.59	0.11
	0.0-0.2	0.61	0.10	0.60	0.11	0.60	0.10	0.0-0.2	0.60	0.11	0.61	0.11
A	0.8-1.0	51.92	4.14	51.12	3.75	49.74	3.66	0.8-1.0	49.85	3.36	50.31	3.82
	0.6-0.8	49.47	4.40	49.40	4.31	48.89	4.02	0.6-0.8	49.03	4.21	49.22	4.12
	0.4-0.6	48.53	4.20	48.62	4.28	48.26	4.04	0.4-0.6	48.49	4.21	48.49	4.14
	0.2-0.4	48.00	4.05	48.03	4.05	48.10	4.21	0.2-0.4	48.12	4.16	47.97	4.15
	0.0-0.2	47.72	4.00	47.70	3.97	47.80	4.07	0.0-0.2	47.87	3.99	47.71	3.97
Fd	0.8-1.0	0.58	0.13	0.54	0.14	0.48	0.14	0.8-1.0	0.53	0.16	0.51	0.14
	0.6-0.8	0.49	0.16	0.47	0.17	0.45	0.16	0.6-0.8	0.45	0.18	0.46	0.16
	0.4-0.6	0.44	0.17	0.43	0.18	0.42	0.17	0.4-0.6	0.43	0.17	0.43	0.17
	0.2-0.4	0.40	0.17	0.40	0.17	0.41	0.18	0.2-0.4	0.41	0.17	0.40	0.18
	0.0-0.2	0.38	0.17	0.39	0.17	0.39	0.17	0.0-0.2	0.39	0.17	0.38	0.17
Fs	0.8-1.0	0.23	0.08	0.24	0.07	0.25	0.07	0.8-1.0	0.25	0.07	0.23	0.08
	0.6-0.8	0.25	0.09	0.25	0.09	0.25	0.09	0.6-0.8	0.25	0.09	0.25	0.09
	0.4-0.6	0.26	0.09	0.25	0.09	0.26	0.09	0.4-0.6	0.25	0.09	0.25	0.09
	0.2-0.4	0.26	0.09	0.26	0.09	0.26	0.09	0.2-0.4	0.26	0.09	0.26	0.09
	0.0-0.2	0.26	0.09	0.26	0.09	0.26	0.09	0.0-0.2	0.26	0.09	0.26	0.09
Fv	0.8-1.0	0.18	0.11	0.22	0.13	0.27	0.14	0.8-1.0	0.23	0.14	0.26	0.14
	0.6-0.8	0.27	0.14	0.28	0.16	0.30	0.16	0.6-0.8	0.30	0.17	0.30	0.16
	0.4-0.6	0.31	0.17	0.31	0.17	0.32	0.17	0.4-0.6	0.32	0.17	0.31	0.17
	0.2-0.4	0.34	0.18	0.34	0.18	0.34	0.18	0.2-0.4	0.33	0.18	0.34	0.18
	0.0-0.2	0.36	0.18	0.36	0.18	0.35	0.18	0.0-0.2	0.35	0.18	0.36	0.18

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-13. SC Chip 13: Dense Mountain

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	12204	100%	12204	100%	12204	100%	0.0-1.0	12204	100%	12204	100%
N_5	0.8-1.0	2	0%	8	0%	17	0%	0.8-1.0	15	0%	6	0%
N_4	0.6-0.8	296	2%	388	3%	463	4%	0.6-0.8	349	3%	490	4%
N_3	0.4-0.6	2153	18%	2078	17%	2612	21%	0.4-0.6	1974	16%	2550	21%
N_2	0.2-0.4	5335	44%	5326	44%	5555	46%	0.2-0.4	5258	43%	5463	45%
N_1	0.0-0.2	4418	36%	4404	36%	3557	29%	0.0-0.2	4608	38%	3695	30%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.76	0.02	0.75	0.03	0.76	0.02	0.8-1.0	0.75	0.03	0.75	0.02
	0.6-0.8	0.75	0.03	0.75	0.03	0.75	0.03	0.6-0.8	0.75	0.03	0.75	0.03
	0.4-0.6	0.75	0.03	0.75	0.03	0.75	0.03	0.4-0.6	0.75	0.03	0.75	0.03
	0.2-0.4	0.75	0.03	0.75	0.03	0.75	0.03	0.2-0.4	0.75	0.03	0.75	0.03
	0.0-0.2	0.75	0.03	0.75	0.03	0.75	0.03	0.0-0.2	0.75	0.03	0.75	0.03
A	0.8-1.0	44.52	0.56	43.51	3.16	45.13	1.53	0.8-1.0	43.77	3.43	44.30	2.60
	0.6-0.8	42.92	3.04	43.07	2.87	43.46	3.00	0.6-0.8	43.10	2.85	43.55	2.83
	0.4-0.6	43.15	2.92	43.06	2.96	43.33	2.80	0.4-0.6	43.26	2.87	43.22	3.00
	0.2-0.4	43.28	2.91	43.27	2.92	43.21	2.90	0.2-0.4	43.21	2.90	43.26	2.85
	0.0-0.2	43.18	2.88	43.23	2.86	43.09	2.97	0.0-0.2	43.21	2.93	43.08	2.92
Fd	0.8-1.0	0.10	0.02	0.07	0.03	0.12	0.05	0.8-1.0	0.07	0.03	0.10	0.03
	0.6-0.8	0.08	0.04	0.08	0.04	0.09	0.05	0.6-0.8	0.08	0.04	0.08	0.04
	0.4-0.6	0.08	0.04	0.08	0.04	0.08	0.04	0.4-0.6	0.08	0.04	0.08	0.04
	0.2-0.4	0.08	0.04	0.08	0.04	0.08	0.04	0.2-0.4	0.08	0.04	0.08	0.04
	0.0-0.2	0.08	0.04	0.08	0.04	0.08	0.04	0.0-0.2	0.08	0.04	0.08	0.04
Fs	0.8-1.0	0.20	0.01	0.22	0.06	0.16	0.04	0.8-1.0	0.21	0.05	0.18	0.04
	0.6-0.8	0.21	0.06	0.21	0.05	0.20	0.06	0.6-0.8	0.21	0.06	0.20	0.06
	0.4-0.6	0.21	0.06	0.21	0.06	0.21	0.06	0.4-0.6	0.21	0.06	0.21	0.06
	0.2-0.4	0.21	0.06	0.21	0.06	0.21	0.06	0.2-0.4	0.21	0.06	0.21	0.06
	0.0-0.2	0.21	0.06	0.21	0.06	0.21	0.06	0.0-0.2	0.21	0.06	0.21	0.06
Fv	0.8-1.0	0.70	0.04	0.71	0.07	0.72	0.04	0.8-1.0	0.72	0.05	0.72	0.02
	0.6-0.8	0.71	0.05	0.71	0.05	0.71	0.05	0.6-0.8	0.71	0.05	0.72	0.05
	0.4-0.6	0.71	0.05	0.71	0.06	0.71	0.05	0.4-0.6	0.71	0.05	0.71	0.06
	0.2-0.4	0.71	0.06	0.71	0.06	0.71	0.06	0.2-0.4	0.71	0.06	0.71	0.05
	0.0-0.2	0.71	0.05	0.71	0.05	0.71	0.05	0.0-0.2	0.71	0.05	0.71	0.05

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-14. SC Chip 14: Mountain

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	12960	100%	12960	100%	12960	100%	0.0-1.0	12960	100%	12960	100%
N_5	0.8-1.0	25	0%	24	0%	51	0%	0.8-1.0	9	0%	48	0%
N_4	0.6-0.8	542	4%	554	4%	776	6%	0.6-0.8	468	4%	786	6%
N_3	0.4-0.6	2650	20%	2516	19%	3182	25%	0.4-0.6	2288	18%	3162	24%
N_2	0.2-0.4	5587	43%	5551	43%	5785	45%	0.2-0.4	5666	44%	5704	44%
N_1	0.0-0.2	4156	32%	4315	33%	3166	24%	0.0-0.2	4529	35%	3260	25%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.68	0.04	0.69	0.04	0.68	0.06	0.8-1.0	0.73	0.06	0.69	0.05
	0.6-0.8	0.71	0.05	0.71	0.06	0.72	0.05	0.6-0.8	0.72	0.06	0.71	0.06
	0.4-0.6	0.72	0.05	0.73	0.05	0.73	0.05	0.4-0.6	0.73	0.05	0.73	0.05
	0.2-0.4	0.73	0.04	0.73	0.05	0.73	0.04	0.2-0.4	0.73	0.05	0.73	0.04
	0.0-0.2	0.73	0.05	0.73	0.04	0.73	0.05	0.0-0.2	0.73	0.05	0.73	0.05
A	0.8-1.0	44.41	2.95	44.44	2.63	44.02	3.07	0.8-1.0	46.42	1.50	44.53	3.04
	0.6-0.8	44.98	2.96	45.18	3.22	45.56	3.13	0.6-0.8	45.36	2.95	45.49	3.06
	0.4-0.6	45.27	3.09	45.30	3.18	45.37	2.98	0.4-0.6	45.26	3.12	45.26	3.03
	0.2-0.4	45.20	2.96	45.16	2.96	45.12	2.97	0.2-0.4	45.21	3.01	45.17	2.96
	0.0-0.2	45.13	3.00	45.13	2.91	45.02	3.02	0.0-0.2	45.08	2.93	45.05	3.01
Fd	0.8-1.0	0.19	0.09	0.17	0.06	0.19	0.09	0.8-1.0	0.16	0.05	0.18	0.08
	0.6-0.8	0.17	0.09	0.16	0.10	0.17	0.09	0.6-0.8	0.15	0.08	0.17	0.10
	0.4-0.6	0.16	0.09	0.16	0.09	0.16	0.09	0.4-0.6	0.15	0.08	0.15	0.09
	0.2-0.4	0.15	0.08	0.15	0.08	0.15	0.08	0.2-0.4	0.15	0.08	0.15	0.08
	0.0-0.2	0.15	0.08	0.14	0.08	0.14	0.08	0.0-0.2	0.15	0.08	0.14	0.08
Fs	0.8-1.0	0.23	0.06	0.23	0.06	0.25	0.06	0.8-1.0	0.20	0.05	0.24	0.06
	0.6-0.8	0.22	0.07	0.21	0.07	0.21	0.07	0.6-0.8	0.20	0.06	0.21	0.06
	0.4-0.6	0.20	0.06	0.20	0.07	0.20	0.06	0.4-0.6	0.20	0.07	0.20	0.06
	0.2-0.4	0.20	0.06	0.21	0.06	0.20	0.06	0.2-0.4	0.20	0.06	0.20	0.06
	0.0-0.2	0.20	0.06	0.20	0.06	0.20	0.06	0.0-0.2	0.21	0.06	0.20	0.07
Fv	0.8-1.0	0.57	0.09	0.60	0.07	0.56	0.11	0.8-1.0	0.64	0.04	0.57	0.09
	0.6-0.8	0.61	0.10	0.63	0.11	0.62	0.10	0.6-0.8	0.65	0.09	0.62	0.10
	0.4-0.6	0.64	0.10	0.64	0.09	0.64	0.10	0.4-0.6	0.65	0.09	0.64	0.09
	0.2-0.4	0.65	0.09	0.64	0.09	0.65	0.09	0.2-0.4	0.64	0.09	0.65	0.09
	0.0-0.2	0.65	0.09	0.65	0.09	0.65	0.09	0.0-0.2	0.65	0.09	0.65	0.09

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-15. SC Chip 15: Highway 101

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14040	100%	14040	100%	14040	100%	0.0-1.0	14040	100%	14040	100%
N_5	0.8-1.0	65	0%	48	0%	92	1%	0.8-1.0	33	0%	76	1%
N_4	0.6-0.8	1043	7%	718	5%	1066	8%	0.6-0.8	601	4%	1107	8%
N_3	0.4-0.6	3583	26%	2963	21%	3766	27%	0.4-0.6	2893	21%	3840	27%
N_2	0.2-0.4	5995	43%	6280	45%	5964	42%	0.2-0.4	6185	44%	5956	42%
N_1	0.0-0.2	3354	24%	4031	29%	3152	22%	0.0-0.2	4328	31%	3061	22%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.47	0.06	0.50	0.08	0.48	0.06	0.8-1.0	0.50	0.09	0.49	0.06
	0.6-0.8	0.49	0.08	0.50	0.08	0.50	0.08	0.6-0.8	0.50	0.10	0.50	0.09
	0.4-0.6	0.51	0.10	0.51	0.10	0.51	0.10	0.4-0.6	0.51	0.10	0.51	0.10
	0.2-0.4	0.51	0.10	0.51	0.10	0.51	0.10	0.2-0.4	0.51	0.10	0.51	0.10
	0.0-0.2	0.51	0.10	0.51	0.10	0.52	0.10	0.0-0.2	0.52	0.10	0.51	0.10
A	0.8-1.0	48.64	2.71	50.40	5.00	48.81	3.11	0.8-1.0	47.00	3.54	49.20	3.68
	0.6-0.8	48.53	3.51	48.70	3.46	48.34	3.44	0.6-0.8	48.67	3.29	48.55	3.33
	0.4-0.6	48.47	3.32	48.48	3.52	48.34	3.37	0.4-0.6	48.61	3.45	48.30	3.30
	0.2-0.4	48.33	3.37	48.33	3.41	48.32	3.42	0.2-0.4	48.26	3.41	48.33	3.42
	0.0-0.2	48.24	3.53	48.24	3.25	48.46	3.41	0.0-0.2	48.31	3.37	48.42	3.52
Fd	0.8-1.0	0.53	0.09	0.53	0.15	0.54	0.09	0.8-1.0	0.47	0.15	0.53	0.11
	0.6-0.8	0.51	0.13	0.50	0.13	0.50	0.13	0.6-0.8	0.51	0.15	0.51	0.13
	0.4-0.6	0.49	0.14	0.50	0.14	0.49	0.14	0.4-0.6	0.50	0.14	0.49	0.14
	0.2-0.4	0.49	0.14	0.49	0.14	0.49	0.14	0.2-0.4	0.49	0.14	0.49	0.14
	0.0-0.2	0.49	0.14	0.49	0.14	0.49	0.14	0.0-0.2	0.49	0.14	0.49	0.14
Fs	0.8-1.0	0.29	0.07	0.26	0.08	0.27	0.08	0.8-1.0	0.30	0.08	0.27	0.08
	0.6-0.8	0.27	0.09	0.27	0.09	0.28	0.09	0.6-0.8	0.26	0.09	0.27	0.09
	0.4-0.6	0.27	0.09	0.27	0.09	0.27	0.09	0.4-0.6	0.27	0.09	0.28	0.09
	0.2-0.4	0.28	0.09	0.27	0.09	0.28	0.09	0.2-0.4	0.28	0.09	0.28	0.09
	0.0-0.2	0.28	0.09	0.27	0.09	0.27	0.09	0.0-0.2	0.28	0.09	0.27	0.09
Fv	0.8-1.0	0.18	0.07	0.21	0.10	0.19	0.07	0.8-1.0	0.23	0.11	0.20	0.08
	0.6-0.8	0.22	0.11	0.22	0.11	0.22	0.11	0.6-0.8	0.23	0.13	0.22	0.11
	0.4-0.6	0.24	0.13	0.23	0.13	0.24	0.13	0.4-0.6	0.23	0.13	0.24	0.13
	0.2-0.4	0.24	0.13	0.24	0.13	0.23	0.13	0.2-0.4	0.24	0.13	0.24	0.13
	0.0-0.2	0.23	0.13	0.24	0.13	0.24	0.13	0.0-0.2	0.24	0.13	0.24	0.13

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-16. SC Chip 16: High Density Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14796	100%	14796	100%	14796	100%	0.0-1.0	14796	100%	14796	100%
N_5	0.8-1.0	126	1%	50	0%	132	1%	0.8-1.0	38	0%	121	1%
N_4	0.6-0.8	1100	7%	769	5%	1313	9%	0.6-0.8	737	5%	1275	9%
N_3	0.4-0.6	4002	27%	3371	23%	4220	29%	0.4-0.6	3201	22%	4277	29%
N_2	0.2-0.4	6339	43%	6568	44%	6112	41%	0.2-0.4	6511	44%	6075	41%
N_1	0.0-0.2	3229	22%	4038	27%	3019	20%	0.0-0.2	4309	29%	3048	21%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.45	0.08	0.49	0.08	0.45	0.08	0.8-1.0	0.52	0.09	0.44	0.08
	0.6-0.8	0.48	0.08	0.48	0.08	0.48	0.07	0.6-0.8	0.49	0.09	0.48	0.07
	0.4-0.6	0.49	0.08	0.49	0.08	0.49	0.08	0.4-0.6	0.50	0.08	0.49	0.08
	0.2-0.4	0.50	0.08	0.50	0.08	0.50	0.08	0.2-0.4	0.50	0.08	0.50	0.08
	0.0-0.2	0.51	0.08	0.50	0.08	0.51	0.08	0.0-0.2	0.50	0.07	0.51	0.08
A	0.8-1.0	45.37	2.81	45.47	2.88	45.42	2.84	0.8-1.0	47.08	3.14	45.77	2.57
	0.6-0.8	45.42	3.05	45.08	3.27	45.54	3.01	0.6-0.8	45.99	3.33	45.39	2.95
	0.4-0.6	45.09	2.97	45.32	3.13	45.13	3.05	0.4-0.6	45.32	3.15	45.07	3.09
	0.2-0.4	45.00	3.14	45.00	3.11	44.98	3.10	0.2-0.4	45.04	3.09	44.95	3.13
	0.0-0.2	44.92	3.23	44.87	3.05	44.82	3.23	0.0-0.2	44.66	3.00	45.01	3.16
Fd	0.8-1.0	0.45	0.11	0.42	0.10	0.46	0.11	0.8-1.0	0.40	0.09	0.46	0.09
	0.6-0.8	0.43	0.11	0.42	0.11	0.43	0.11	0.6-0.8	0.42	0.11	0.42	0.11
	0.4-0.6	0.41	0.10	0.42	0.11	0.41	0.10	0.4-0.6	0.41	0.11	0.41	0.10
	0.2-0.4	0.40	0.11	0.40	0.11	0.40	0.11	0.2-0.4	0.41	0.11	0.40	0.11
	0.0-0.2	0.40	0.11	0.40	0.10	0.39	0.11	0.0-0.2	0.40	0.10	0.40	0.11
Fs	0.8-1.0	0.37	0.11	0.38	0.12	0.36	0.11	0.8-1.0	0.31	0.11	0.36	0.10
	0.6-0.8	0.38	0.11	0.40	0.11	0.37	0.10	0.6-0.8	0.36	0.11	0.38	0.10
	0.4-0.6	0.39	0.10	0.38	0.10	0.39	0.10	0.4-0.6	0.38	0.11	0.39	0.11
	0.2-0.4	0.39	0.10	0.39	0.10	0.39	0.10	0.2-0.4	0.39	0.10	0.39	0.10
	0.0-0.2	0.39	0.11	0.39	0.10	0.39	0.11	0.0-0.2	0.40	0.10	0.39	0.10
Fv	0.8-1.0	0.18	0.07	0.20	0.08	0.18	0.09	0.8-1.0	0.29	0.13	0.18	0.07
	0.6-0.8	0.19	0.09	0.19	0.09	0.20	0.10	0.6-0.8	0.22	0.11	0.19	0.09
	0.4-0.6	0.20	0.10	0.20	0.09	0.20	0.10	0.4-0.6	0.21	0.11	0.20	0.10
	0.2-0.4	0.21	0.10	0.21	0.10	0.21	0.10	0.2-0.4	0.20	0.10	0.21	0.10
	0.0-0.2	0.21	0.10	0.21	0.10	0.21	0.10	0.0-0.2	0.20	0.09	0.21	0.11

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-17. SC Chip 17: Oblique Residential

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15012	100%	15012	100%	15012	100%	0.0-1.0	15012	100%	15012	100%
N_5	0.8-1.0	62	0%	20	0%	89	1%	0.8-1.0	22	0%	82	1%
N_4	0.6-0.8	742	5%	672	4%	954	6%	0.6-0.8	581	4%	964	6%
N_3	0.4-0.6	3290	22%	2810	19%	3838	26%	0.4-0.6	2910	19%	3813	25%
N_2	0.2-0.4	6552	44%	6545	44%	6403	43%	0.2-0.4	6572	44%	6502	43%
N_1	0.0-0.2	4366	29%	4965	33%	3728	25%	0.0-0.2	4927	33%	3651	24%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.63	0.08	0.71	0.04	0.65	0.09	0.8-1.0	0.70	0.05	0.66	0.10
	0.6-0.8	0.68	0.08	0.69	0.09	0.68	0.08	0.6-0.8	0.70	0.07	0.69	0.08
	0.4-0.6	0.70	0.08	0.70	0.08	0.70	0.07	0.4-0.6	0.70	0.07	0.70	0.08
	0.2-0.4	0.71	0.06	0.71	0.06	0.71	0.06	0.2-0.4	0.71	0.07	0.71	0.06
	0.0-0.2	0.72	0.06	0.71	0.06	0.72	0.06	0.0-0.2	0.71	0.06	0.72	0.06
A	0.8-1.0	46.99	2.96	46.24	1.79	47.17	2.65	0.8-1.0	48.61	2.57	47.69	2.70
	0.6-0.8	46.59	2.66	46.51	2.79	46.89	2.81	0.6-0.8	47.18	2.50	46.94	2.60
	0.4-0.6	46.71	2.74	46.60	2.77	46.72	2.64	0.4-0.6	46.76	2.67	46.68	2.68
	0.2-0.4	46.74	2.53	46.78	2.52	46.66	2.53	0.2-0.4	46.68	2.56	46.70	2.56
	0.0-0.2	46.69	2.49	46.72	2.51	46.74	2.53	0.0-0.2	46.66	2.55	46.69	2.49
Fd	0.8-1.0	0.25	0.07	0.18	0.07	0.26	0.07	0.8-1.0	0.20	0.08	0.24	0.07
	0.6-0.8	0.22	0.08	0.21	0.09	0.22	0.08	0.6-0.8	0.20	0.07	0.22	0.08
	0.4-0.6	0.20	0.08	0.20	0.07	0.20	0.08	0.4-0.6	0.20	0.07	0.20	0.08
	0.2-0.4	0.19	0.07	0.19	0.07	0.19	0.07	0.2-0.4	0.19	0.07	0.19	0.07
	0.0-0.2	0.18	0.07	0.19	0.07	0.19	0.07	0.0-0.2	0.19	0.07	0.19	0.07
Fs	0.8-1.0	0.22	0.13	0.22	0.05	0.21	0.11	0.8-1.0	0.17	0.07	0.19	0.12
	0.6-0.8	0.22	0.10	0.22	0.10	0.21	0.10	0.6-0.8	0.20	0.09	0.21	0.09
	0.4-0.6	0.21	0.10	0.21	0.09	0.21	0.09	0.4-0.6	0.20	0.09	0.21	0.09
	0.2-0.4	0.20	0.08	0.20	0.08	0.20	0.08	0.2-0.4	0.20	0.08	0.20	0.08
	0.0-0.2	0.20	0.07	0.20	0.08	0.20	0.08	0.0-0.2	0.20	0.08	0.20	0.08
Fv	0.8-1.0	0.53	0.14	0.60	0.06	0.53	0.12	0.8-1.0	0.63	0.11	0.57	0.14
	0.6-0.8	0.56	0.13	0.57	0.14	0.57	0.12	0.6-0.8	0.61	0.11	0.58	0.13
	0.4-0.6	0.58	0.12	0.59	0.12	0.59	0.12	0.4-0.6	0.60	0.11	0.59	0.12
	0.2-0.4	0.61	0.10	0.60	0.10	0.61	0.10	0.2-0.4	0.60	0.11	0.61	0.10
	0.0-0.2	0.62	0.09	0.61	0.10	0.61	0.10	0.0-0.2	0.61	0.10	0.61	0.09

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-18. SC Chip 18: Residential (square)

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15120	100%	15120	100%	15120	100%	0.0-1.0	15120	100%	15120	100%
N_5	0.8-1.0	132	1%	74	0%	134	1%	0.8-1.0	23	0%	179	1%
N_4	0.6-0.8	1337	9%	821	5%	1458	10%	0.6-0.8	702	5%	1654	11%
N_3	0.4-0.6	4240	28%	3353	22%	4495	30%	0.4-0.6	3351	22%	4399	29%
N_2	0.2-0.4	6151	41%	6633	44%	6019	40%	0.2-0.4	6674	44%	5988	40%
N_1	0.0-0.2	3260	22%	4239	28%	3014	20%	0.0-0.2	4370	29%	2900	19%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.50	0.08	0.49	0.10	0.49	0.08	0.8-1.0	0.53	0.10	0.50	0.08
	0.6-0.8	0.51	0.08	0.51	0.09	0.51	0.08	0.6-0.8	0.52	0.09	0.51	0.08
	0.4-0.6	0.52	0.09	0.52	0.09	0.52	0.09	0.4-0.6	0.52	0.09	0.52	0.09
	0.2-0.4	0.53	0.09	0.53	0.09	0.53	0.09	0.2-0.4	0.53	0.09	0.53	0.09
	0.0-0.2	0.54	0.09	0.53	0.09	0.54	0.09	0.0-0.2	0.53	0.09	0.54	0.09
A	0.8-1.0	42.84	3.57	42.89	4.71	43.26	3.12	0.8-1.0	44.09	3.68	43.23	3.23
	0.6-0.8	42.49	3.10	42.24	3.21	42.46	2.88	0.6-0.8	42.85	3.23	42.56	3.07
	0.4-0.6	42.56	3.02	42.43	3.08	42.55	3.06	0.4-0.6	42.52	3.08	42.52	3.07
	0.2-0.4	42.51	3.02	42.51	3.01	42.49	3.03	0.2-0.4	42.52	3.03	42.49	2.96
	0.0-0.2	42.37	3.00	42.58	2.94	42.42	3.04	0.0-0.2	42.38	2.94	42.39	3.06
Fd	0.8-1.0	0.30	0.11	0.32	0.14	0.31	0.11	0.8-1.0	0.27	0.11	0.30	0.11
	0.6-0.8	0.26	0.09	0.27	0.09	0.27	0.09	0.6-0.8	0.25	0.09	0.27	0.09
	0.4-0.6	0.26	0.09	0.26	0.09	0.26	0.09	0.4-0.6	0.25	0.09	0.26	0.09
	0.2-0.4	0.26	0.09	0.25	0.09	0.25	0.09	0.2-0.4	0.26	0.09	0.25	0.09
	0.0-0.2	0.25	0.09	0.26	0.09	0.25	0.09	0.0-0.2	0.26	0.09	0.25	0.09
Fs	0.8-1.0	0.42	0.13	0.42	0.13	0.41	0.12	0.8-1.0	0.37	0.11	0.41	0.12
	0.6-0.8	0.44	0.11	0.45	0.11	0.44	0.10	0.6-0.8	0.43	0.11	0.44	0.11
	0.4-0.6	0.44	0.11	0.44	0.11	0.44	0.11	0.4-0.6	0.44	0.11	0.44	0.11
	0.2-0.4	0.43	0.11	0.44	0.11	0.43	0.11	0.2-0.4	0.43	0.11	0.43	0.11
	0.0-0.2	0.43	0.11	0.43	0.11	0.43	0.11	0.0-0.2	0.44	0.11	0.43	0.11
Fv	0.8-1.0	0.28	0.09	0.26	0.10	0.27	0.09	0.8-1.0	0.35	0.12	0.28	0.10
	0.6-0.8	0.29	0.10	0.28	0.10	0.29	0.10	0.6-0.8	0.32	0.12	0.29	0.10
	0.4-0.6	0.30	0.11	0.30	0.11	0.30	0.11	0.4-0.6	0.31	0.11	0.30	0.11
	0.2-0.4	0.31	0.11	0.31	0.11	0.31	0.11	0.2-0.4	0.31	0.11	0.31	0.12
	0.0-0.2	0.32	0.12	0.31	0.11	0.32	0.12	0.0-0.2	0.30	0.11	0.32	0.12

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-19. SC Chip 19: Residential with cul-de-sacs

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15336	100%	15336	100%	15336	100%	0.0-1.0	15336	100%	15336	100%
N_5	0.8-1.0	107	1%	48	0%	107	1%	0.8-1.0	48	0%	128	1%
N_4	0.6-0.8	1033	7%	706	5%	1099	7%	0.6-0.8	667	4%	1304	9%
N_3	0.4-0.6	3705	24%	3188	21%	3970	26%	0.4-0.6	2958	19%	4201	27%
N_2	0.2-0.4	6541	43%	6717	44%	6545	43%	0.2-0.4	6594	43%	6419	42%
N_1	0.0-0.2	3950	26%	4677	30%	3615	24%	0.0-0.2	5069	33%	3284	21%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.55	0.10	0.58	0.13	0.57	0.10	0.8-1.0	0.65	0.09	0.56	0.11
	0.6-0.8	0.60	0.12	0.62	0.12	0.61	0.12	0.6-0.8	0.64	0.12	0.62	0.12
	0.4-0.6	0.64	0.12	0.64	0.12	0.65	0.12	0.4-0.6	0.65	0.12	0.64	0.11
	0.2-0.4	0.66	0.11	0.66	0.11	0.66	0.11	0.2-0.4	0.66	0.11	0.67	0.11
	0.0-0.2	0.68	0.11	0.67	0.11	0.67	0.11	0.0-0.2	0.67	0.11	0.68	0.11
A	0.8-1.0	43.19	4.20	43.66	5.34	43.61	4.53	0.8-1.0	46.67	4.40	43.38	4.06
	0.6-0.8	44.24	4.21	44.86	4.45	44.57	4.35	0.6-0.8	45.53	4.25	44.60	4.26
	0.4-0.6	44.81	4.38	44.83	4.28	45.00	4.28	0.4-0.6	45.05	4.39	44.85	4.32
	0.2-0.4	45.45	4.24	45.23	4.24	45.39	4.21	0.2-0.4	45.23	4.26	45.50	4.21
	0.0-0.2	45.70	4.11	45.68	4.19	45.59	4.24	0.0-0.2	45.39	4.18	45.66	4.20
Fd	0.8-1.0	0.21	0.07	0.23	0.10	0.22	0.08	0.8-1.0	0.23	0.10	0.21	0.07
	0.6-0.8	0.21	0.08	0.22	0.09	0.22	0.08	0.6-0.8	0.22	0.08	0.22	0.08
	0.4-0.6	0.21	0.08	0.21	0.08	0.21	0.08	0.4-0.6	0.21	0.08	0.21	0.08
	0.2-0.4	0.21	0.07	0.21	0.07	0.21	0.07	0.2-0.4	0.21	0.08	0.21	0.07
	0.0-0.2	0.20	0.07	0.21	0.07	0.21	0.07	0.0-0.2	0.21	0.07	0.21	0.07
Fs	0.8-1.0	0.43	0.16	0.38	0.20	0.40	0.17	0.8-1.0	0.25	0.16	0.42	0.16
	0.6-0.8	0.35	0.17	0.32	0.17	0.34	0.18	0.6-0.8	0.29	0.17	0.33	0.17
	0.4-0.6	0.31	0.17	0.31	0.17	0.30	0.17	0.4-0.6	0.30	0.17	0.31	0.17
	0.2-0.4	0.28	0.16	0.29	0.16	0.28	0.16	0.2-0.4	0.29	0.16	0.28	0.16
	0.0-0.2	0.26	0.15	0.27	0.16	0.27	0.16	0.0-0.2	0.28	0.16	0.27	0.15
Fv	0.8-1.0	0.36	0.14	0.39	0.20	0.38	0.15	0.8-1.0	0.52	0.18	0.37	0.15
	0.6-0.8	0.43	0.17	0.46	0.18	0.44	0.18	0.6-0.8	0.49	0.18	0.45	0.17
	0.4-0.6	0.47	0.17	0.48	0.17	0.49	0.18	0.4-0.6	0.49	0.18	0.48	0.17
	0.2-0.4	0.51	0.17	0.50	0.17	0.51	0.17	0.2-0.4	0.50	0.17	0.51	0.17
	0.0-0.2	0.53	0.16	0.52	0.17	0.52	0.17	0.0-0.2	0.51	0.17	0.52	0.17

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table B-20. SC Chip 20: High Density Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15336	100%	15336	100%	15336	100%	0.0-1.0	15336	100%	15336	100%
N_5	0.8-1.0	67	0%	41	0%	76	0%	0.8-1.0	29	0%	127	1%
N_4	0.6-0.8	1266	8%	764	5%	1277	8%	0.6-0.8	813	5%	1545	10%
N_3	0.4-0.6	4174	27%	3409	22%	4338	28%	0.4-0.6	3241	21%	4643	30%
N_2	0.2-0.4	6568	43%	6837	45%	6412	42%	0.2-0.4	6683	44%	6164	40%
N_1	0.0-0.2	3261	21%	4285	28%	3233	21%	0.0-0.2	4570	30%	2857	19%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.50	0.08	0.56	0.08	0.50	0.08	0.8-1.0	0.54	0.07	0.51	0.07
	0.6-0.8	0.54	0.08	0.55	0.08	0.54	0.08	0.6-0.8	0.54	0.09	0.54	0.08
	0.4-0.6	0.55	0.09	0.55	0.09	0.55	0.09	0.4-0.6	0.55	0.09	0.55	0.09
	0.2-0.4	0.56	0.09	0.56	0.09	0.56	0.09	0.2-0.4	0.56	0.09	0.56	0.09
	0.0-0.2	0.56	0.09	0.56	0.09	0.56	0.09	0.0-0.2	0.56	0.09	0.57	0.09
A	0.8-1.0	42.27	2.55	40.57	5.65	42.88	2.50	0.8-1.0	42.40	2.78	42.09	2.63
	0.6-0.8	42.20	3.05	41.64	3.51	42.20	3.03	0.6-0.8	42.46	3.27	42.15	3.09
	0.4-0.6	42.20	3.16	42.24	3.11	42.14	3.05	0.4-0.6	42.26	3.18	42.22	3.11
	0.2-0.4	42.17	3.05	42.16	3.00	42.16	3.10	0.2-0.4	42.09	3.05	42.20	3.10
	0.0-0.2	42.12	3.06	42.24	3.05	42.20	3.11	0.0-0.2	42.17	3.02	42.04	3.01
Fd	0.8-1.0	0.22	0.07	0.21	0.10	0.24	0.07	0.8-1.0	0.20	0.08	0.23	0.08
	0.6-0.8	0.21	0.08	0.21	0.07	0.22	0.08	0.6-0.8	0.21	0.08	0.22	0.08
	0.4-0.6	0.21	0.08	0.21	0.08	0.21	0.08	0.4-0.6	0.21	0.08	0.21	0.08
	0.2-0.4	0.21	0.07	0.21	0.07	0.21	0.07	0.2-0.4	0.21	0.07	0.21	0.07
	0.0-0.2	0.21	0.07	0.21	0.08	0.21	0.07	0.0-0.2	0.21	0.07	0.21	0.07
Fs	0.8-1.0	0.46	0.11	0.43	0.13	0.45	0.10	0.8-1.0	0.42	0.11	0.45	0.09
	0.6-0.8	0.45	0.11	0.45	0.12	0.45	0.11	0.6-0.8	0.44	0.12	0.45	0.12
	0.4-0.6	0.44	0.12	0.43	0.12	0.44	0.12	0.4-0.6	0.44	0.12	0.44	0.12
	0.2-0.4	0.43	0.12	0.43	0.12	0.43	0.12	0.2-0.4	0.43	0.12	0.43	0.12
	0.0-0.2	0.43	0.12	0.43	0.12	0.43	0.12	0.0-0.2	0.43	0.12	0.43	0.11
Fv	0.8-1.0	0.31	0.09	0.36	0.11	0.31	0.08	0.8-1.0	0.39	0.11	0.32	0.07
	0.6-0.8	0.34	0.10	0.34	0.11	0.33	0.10	0.6-0.8	0.35	0.11	0.34	0.11
	0.4-0.6	0.35	0.11	0.35	0.11	0.35	0.11	0.4-0.6	0.36	0.11	0.35	0.11
	0.2-0.4	0.36	0.11	0.36	0.11	0.36	0.11	0.2-0.4	0.36	0.11	0.36	0.11
	0.0-0.2	0.37	0.11	0.36	0.11	0.37	0.12	0.0-0.2	0.36	0.11	0.37	0.11

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Appendix C: Coherent Scatterer Response Tables – Sublook Entropy Method

The following tables display the results of Sublook Entropy analysis. Each data chip has a separate table comparing selected polarizations in terms of both SE value distribution and the polarimetric parameters. N_x is the number of pixels within the SE range indicated in the "Range" column. For the polarimetric decomposition parameters, the displayed values are the statistical mean and standard deviation for each decomposition parameter of those same pixels classified with the SE value indicated in the "Range" column.

Table C-1. SE Chip 1: Golf Course

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14364	100%	14364	100%	14364	100%	0.0-1.0	14364	100%	14364	100%
N_5	0.8-1.0	10687	74%	11021	77%	10011	70%	0.8-1.0	11272	78%	10040	70%
N_4	0.6-0.8	3076	21%	2926	20%	3533	25%	0.6-0.8	2728	19%	3505	24%
N_3	0.4-0.6	558	4%	387	3%	732	5%	0.4-0.6	339	2%	749	5%
N_2	0.2-0.4	42	0%	28	0%	86	1%	0.2-0.4	25	0%	67	0%
N_1	0.0-0.2	1	0%	2	0%	2	0%	0.0-0.2	0	0%	3	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.71	0.08	0.70	0.08	0.71	0.08	0.8-1.0	0.70	0.08	0.71	0.08
	0.6-0.8	0.68	0.09	0.69	0.09	0.69	0.09	0.6-0.8	0.70	0.08	0.68	0.09
	0.4-0.6	0.63	0.10	0.65	0.10	0.64	0.10	0.4-0.6	0.68	0.10	0.64	0.09
	0.2-0.4	0.57	0.09	0.63	0.09	0.58	0.09	0.2-0.4	0.67	0.06	0.59	0.10
	0.0-0.2	0.66	0.00	0.61	0.02	0.61	0.01	0.0-0.2	—	—	0.59	0.01
A	0.8-1.0	45.93	3.19	45.94	3.17	45.88	3.20	0.8-1.0	45.90	3.24	45.94	3.19
	0.6-0.8	45.96	3.23	45.85	3.21	45.98	3.20	0.6-0.8	46.04	3.05	45.91	3.18
	0.4-0.6	45.94	3.42	46.32	4.01	46.39	3.21	0.4-0.6	46.19	3.23	45.99	3.56
	0.2-0.4	46.93	2.96	46.27	2.80	46.66	3.13	0.2-0.4	45.75	2.23	46.82	3.23
	0.0-0.2	49.78	0.00	49.55	1.01	45.65	0.85	0.0-0.2	—	—	46.57	1.29
Fd	0.8-1.0	0.22	0.10	0.23	0.10	0.22	0.10	0.8-1.0	0.23	0.11	0.22	0.10
	0.6-0.8	0.25	0.11	0.24	0.11	0.24	0.11	0.6-0.8	0.23	0.10	0.24	0.11
	0.4-0.6	0.30	0.14	0.28	0.14	0.29	0.13	0.4-0.6	0.25	0.11	0.28	0.13
	0.2-0.4	0.39	0.13	0.31	0.14	0.37	0.12	0.2-0.4	0.24	0.11	0.37	0.12
	0.0-0.2	0.42	0.00	0.44	0.05	0.34	0.01	0.0-0.2	—	—	0.36	0.04
Fs	0.8-1.0	0.22	0.09	0.22	0.09	0.22	0.09	0.8-1.0	0.23	0.09	0.22	0.09
	0.6-0.8	0.24	0.09	0.23	0.09	0.23	0.09	0.6-0.8	0.22	0.08	0.23	0.09
	0.4-0.6	0.25	0.09	0.24	0.10	0.24	0.09	0.4-0.6	0.22	0.08	0.25	0.09
	0.2-0.4	0.24	0.07	0.23	0.06	0.25	0.08	0.2-0.4	0.22	0.08	0.23	0.08
	0.0-0.2	0.14	0.00	0.19	0.01	0.23	0.06	0.0-0.2	—	—	0.26	0.03
Fv	0.8-1.0	0.55	0.13	0.55	0.13	0.55	0.13	0.8-1.0	0.54	0.13	0.55	0.13
	0.6-0.8	0.52	0.14	0.53	0.14	0.52	0.14	0.6-0.8	0.55	0.13	0.52	0.14
	0.4-0.6	0.45	0.15	0.48	0.15	0.47	0.15	0.4-0.6	0.52	0.14	0.47	0.14
	0.2-0.4	0.37	0.11	0.45	0.14	0.38	0.12	0.2-0.4	0.53	0.11	0.40	0.13
	0.0-0.2	0.43	0.00	0.36	0.04	0.43	0.06	0.0-0.2	—	—	0.38	0.01

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-2. SE Chip 2: Oblique Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14796	100%	14796	100%	14796	100%	0.0-1.0	14796	100%	14796	100%
N_5	0.8-1.0	11186	76%	11474	78%	10609	72%	0.8-1.0	11368	77%	10317	70%
N_4	0.6-0.8	3049	21%	2943	20%	3609	24%	0.6-0.8	2992	20%	3699	25%
N_3	0.4-0.6	503	3%	356	2%	526	4%	0.4-0.6	409	3%	711	5%
N_2	0.2-0.4	58	0%	23	0%	51	0%	0.2-0.4	27	0%	69	0%
N_1	0.0-0.2	0	0%	0	0%	1	0%	0.0-0.2	0	0%	0	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.72	0.05	0.72	0.06	0.72	0.05	0.8-1.0	0.72	0.06	0.72	0.05
	0.6-0.8	0.70	0.07	0.71	0.06	0.71	0.07	0.6-0.8	0.71	0.07	0.71	0.06
	0.4-0.6	0.68	0.08	0.69	0.07	0.68	0.08	0.4-0.6	0.70	0.06	0.68	0.08
	0.2-0.4	0.67	0.05	0.66	0.07	0.66	0.06	0.2-0.4	0.68	0.05	0.66	0.06
	0.0-0.2	—	—	—	—	0.61	0.00	0.0-0.2	—	—	—	—
A	0.8-1.0	46.80	2.75	46.87	2.82	46.75	2.80	0.8-1.0	46.75	2.78	46.80	2.77
	0.6-0.8	46.88	2.94	46.70	2.76	46.96	2.76	0.6-0.8	47.04	2.85	46.92	2.85
	0.4-0.6	47.05	3.09	46.59	2.63	47.45	3.06	0.4-0.6	47.48	2.96	46.90	3.02
	0.2-0.4	47.47	3.13	47.26	2.07	48.01	2.80	0.2-0.4	48.76	2.45	46.40	2.92
	0.0-0.2	—	—	—	—	46.01	0.00	0.0-0.2	—	—	—	—
Fd	0.8-1.0	0.19	0.08	0.20	0.08	0.19	0.08	0.8-1.0	0.20	0.08	0.19	0.08
	0.6-0.8	0.21	0.09	0.20	0.08	0.20	0.08	0.6-0.8	0.20	0.08	0.20	0.08
	0.4-0.6	0.22	0.10	0.21	0.10	0.22	0.10	0.4-0.6	0.20	0.09	0.22	0.10
	0.2-0.4	0.23	0.10	0.26	0.07	0.23	0.09	0.2-0.4	0.18	0.07	0.22	0.09
	0.0-0.2	—	—	—	—	0.28	0.00	0.0-0.2	—	—	—	—
Fs	0.8-1.0	0.19	0.07	0.19	0.07	0.19	0.07	0.8-1.0	0.20	0.07	0.19	0.07
	0.6-0.8	0.20	0.07	0.20	0.07	0.20	0.07	0.6-0.8	0.19	0.07	0.20	0.07
	0.4-0.6	0.20	0.09	0.21	0.07	0.20	0.08	0.4-0.6	0.19	0.07	0.21	0.08
	0.2-0.4	0.21	0.07	0.22	0.05	0.21	0.06	0.2-0.4	0.17	0.05	0.23	0.09
	0.0-0.2	—	—	—	—	0.27	0.00	0.0-0.2	—	—	—	—
Fv	0.8-1.0	0.61	0.08	0.61	0.09	0.61	0.08	0.8-1.0	0.61	0.09	0.61	0.08
	0.6-0.8	0.60	0.10	0.60	0.09	0.60	0.10	0.6-0.8	0.61	0.10	0.60	0.09
	0.4-0.6	0.58	0.10	0.58	0.10	0.59	0.12	0.4-0.6	0.61	0.10	0.57	0.11
	0.2-0.4	0.56	0.09	0.52	0.10	0.57	0.11	0.2-0.4	0.65	0.07	0.55	0.10
	0.0-0.2	—	—	—	—	0.45	0.00	0.0-0.2	—	—	—	—

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-3. SE Chip 3: Dense Mountain Peaks

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	12204	100%	12204	100%	12204	100%	0.0-1.0	12204	100%	12204	100%
N_5	0.8-1.0	10021	82%	10062	82%	9402	77%	0.8-1.0	9892	81%	9539	78%
N_4	0.6-0.8	1997	16%	1985	16%	2547	21%	0.6-0.8	2100	17%	2424	20%
N_3	0.4-0.6	182	1%	154	1%	252	2%	0.4-0.6	207	2%	228	2%
N_2	0.2-0.4	4	0%	3	0%	3	0%	0.2-0.4	5	0%	13	0%
N_1	0.0-0.2	0	0%	0	0%	0	0%	0.0-0.2	0	0%	0	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.75	0.03	0.75	0.03	0.75	0.03	0.8-1.0	0.75	0.03	0.75	0.03
	0.6-0.8	0.75	0.03	0.75	0.03	0.76	0.03	0.6-0.8	0.75	0.02	0.75	0.03
	0.4-0.6	0.75	0.02	0.76	0.02	0.75	0.03	0.4-0.6	0.75	0.03	0.75	0.03
	0.2-0.4	0.75	0.02	0.76	0.00	0.73	0.00	0.2-0.4	0.76	0.02	0.76	0.02
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
A	0.8-1.0	44.00	2.34	44.01	2.32	43.98	2.33	0.8-1.0	43.99	2.34	43.97	2.33
	0.6-0.8	44.07	2.33	43.98	2.37	44.16	2.36	0.6-0.8	44.11	2.31	44.10	2.32
	0.4-0.6	43.96	2.06	44.27	2.40	43.81	2.09	0.4-0.6	43.92	2.04	44.49	2.50
	0.2-0.4	42.86	1.67	44.43	0.64	40.71	0.23	0.2-0.4	42.51	2.21	47.01	2.96
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fd	0.8-1.0	0.08	0.04	0.08	0.04	0.08	0.04	0.8-1.0	0.08	0.04	0.09	0.04
	0.6-0.8	0.09	0.04	0.08	0.04	0.09	0.04	0.6-0.8	0.08	0.04	0.08	0.04
	0.4-0.6	0.08	0.04	0.08	0.04	0.08	0.04	0.4-0.6	0.09	0.04	0.09	0.04
	0.2-0.4	0.08	0.03	0.06	0.04	0.08	0.04	0.2-0.4	0.08	0.03	0.12	0.06
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fs	0.8-1.0	0.19	0.05	0.19	0.05	0.19	0.05	0.8-1.0	0.19	0.05	0.19	0.05
	0.6-0.8	0.19	0.05	0.20	0.05	0.19	0.05	0.6-0.8	0.19	0.05	0.19	0.05
	0.4-0.6	0.20	0.05	0.19	0.05	0.20	0.05	0.4-0.6	0.19	0.06	0.19	0.06
	0.2-0.4	0.20	0.03	0.15	0.01	0.25	0.02	0.2-0.4	0.19	0.06	0.13	0.05
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fv	0.8-1.0	0.72	0.05	0.72	0.05	0.72	0.05	0.8-1.0	0.72	0.05	0.72	0.05
	0.6-0.8	0.72	0.05	0.72	0.05	0.72	0.05	0.6-0.8	0.72	0.05	0.72	0.05
	0.4-0.6	0.72	0.05	0.73	0.05	0.72	0.05	0.4-0.6	0.72	0.05	0.73	0.05
	0.2-0.4	0.72	0.03	0.79	0.05	0.68	0.01	0.2-0.4	0.73	0.06	0.75	0.05
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-4. SE Chip 4: Hollywood Forever Memorial Park

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14040	100%	14040	100%	14040	100%	0.0-1.0	14040	100%	14040	100%
N_5	0.8-1.0	9817	70%	10365	74%	9646	69%	0.8-1.0	10525	75%	9674	69%
N_4	0.6-0.8	3474	25%	3143	22%	3576	25%	0.6-0.8	3025	22%	3557	25%
N_3	0.4-0.6	686	5%	486	3%	750	5%	0.4-0.6	448	3%	718	5%
N_2	0.2-0.4	60	0%	43	0%	64	0%	0.2-0.4	41	0%	88	1%
N_1	0.0-0.2	3	0%	3	0%	4	0%	0.0-0.2	1	0%	3	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.53	0.11	0.53	0.11	0.53	0.11	0.8-1.0	0.52	0.11	0.53	0.11
	0.6-0.8	0.49	0.10	0.50	0.10	0.50	0.10	0.6-0.8	0.51	0.10	0.50	0.10
	0.4-0.6	0.47	0.08	0.48	0.09	0.48	0.09	0.4-0.6	0.49	0.10	0.48	0.09
	0.2-0.4	0.45	0.08	0.47	0.08	0.48	0.08	0.2-0.4	0.49	0.08	0.45	0.08
	0.0-0.2	0.42	0.04	0.40	0.02	0.45	0.07	0.0-0.2	0.35	0.00	0.42	0.04
A	0.8-1.0	48.42	4.49	48.57	4.27	48.43	4.52	0.8-1.0	48.52	4.42	48.48	4.47
	0.6-0.8	49.07	4.45	48.80	4.95	49.04	4.37	0.6-0.8	48.98	4.62	48.93	4.57
	0.4-0.6	49.80	3.93	49.50	5.12	49.75	3.95	0.4-0.6	49.62	4.32	49.50	3.82
	0.2-0.4	50.00	4.49	49.69	6.16	48.77	4.31	0.2-0.4	49.36	4.84	50.10	3.83
	0.0-0.2	55.76	2.34	57.57	2.05	53.24	5.38	0.0-0.2	54.00	0.00	55.76	2.34
Fd	0.8-1.0	0.47	0.17	0.48	0.16	0.47	0.17	0.8-1.0	0.48	0.16	0.48	0.17
	0.6-0.8	0.52	0.15	0.50	0.16	0.52	0.15	0.6-0.8	0.51	0.16	0.51	0.15
	0.4-0.6	0.56	0.13	0.53	0.15	0.55	0.13	0.4-0.6	0.53	0.15	0.54	0.13
	0.2-0.4	0.56	0.13	0.55	0.16	0.52	0.12	0.2-0.4	0.50	0.15	0.57	0.12
	0.0-0.2	0.68	0.07	0.73	0.05	0.61	0.14	0.0-0.2	0.75	0.00	0.68	0.07
Fs	0.8-1.0	0.28	0.10	0.27	0.10	0.28	0.10	0.8-1.0	0.28	0.10	0.28	0.10
	0.6-0.8	0.27	0.10	0.28	0.11	0.28	0.10	0.6-0.8	0.27	0.10	0.28	0.10
	0.4-0.6	0.26	0.10	0.28	0.12	0.26	0.09	0.4-0.6	0.27	0.10	0.27	0.09
	0.2-0.4	0.25	0.11	0.31	0.12	0.29	0.08	0.2-0.4	0.29	0.10	0.27	0.09
	0.0-0.2	0.22	0.03	0.20	0.03	0.26	0.07	0.0-0.2	0.13	0.00	0.22	0.03
Fv	0.8-1.0	0.25	0.16	0.24	0.15	0.25	0.16	0.8-1.0	0.24	0.15	0.25	0.16
	0.6-0.8	0.20	0.12	0.21	0.13	0.20	0.12	0.6-0.8	0.22	0.14	0.21	0.12
	0.4-0.6	0.18	0.09	0.19	0.11	0.19	0.10	0.4-0.6	0.20	0.12	0.19	0.10
	0.2-0.4	0.19	0.09	0.14	0.07	0.19	0.09	0.2-0.4	0.21	0.10	0.16	0.09
	0.0-0.2	0.10	0.04	0.08	0.02	0.13	0.07	0.0-0.2	0.12	0.00	0.10	0.04

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-5. SE Chip 5: Los Angeles Memorial Coliseum

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15228	100%	15228	100%	15228	100%	0.0-1.0	15228	100%	15228	100%
N_5	0.8-1.0	10184	67%	11030	72%	10226	67%	0.8-1.0	11586	76%	9837	65%
N_4	0.6-0.8	3913	26%	3506	23%	3944	26%	0.6-0.8	3056	20%	4071	27%
N_3	0.4-0.6	1006	7%	621	4%	954	6%	0.4-0.6	525	3%	1160	8%
N_2	0.2-0.4	122	1%	68	0%	104	1%	0.2-0.4	61	0%	157	1%
N_1	0.0-0.2	3	0%	3	0%	0	0%	0.0-0.2	0	0%	3	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.61	0.13	0.61	0.12	0.61	0.12	0.8-1.0	0.60	0.12	0.61	0.12
	0.6-0.8	0.57	0.12	0.58	0.12	0.57	0.12	0.6-0.8	0.58	0.12	0.57	0.12
	0.4-0.6	0.54	0.11	0.55	0.11	0.54	0.10	0.4-0.6	0.54	0.12	0.55	0.11
	0.2-0.4	0.52	0.09	0.49	0.10	0.52	0.10	0.2-0.4	0.53	0.13	0.53	0.09
	0.0-0.2	0.53	0.03	0.44	0.05	—	—	0.0-0.2	—	—	0.47	0.03
A	0.8-1.0	44.89	4.91	44.88	4.76	44.95	4.85	0.8-1.0	44.78	4.78	44.93	4.88
	0.6-0.8	44.35	4.68	44.36	5.00	44.22	4.83	0.6-0.8	44.58	4.88	44.33	4.80
	0.4-0.6	44.41	4.49	44.12	4.82	44.22	4.50	0.4-0.6	44.19	5.27	44.32	4.46
	0.2-0.4	44.08	4.48	42.49	5.24	45.18	3.97	0.2-0.4	44.12	6.48	44.59	3.96
	0.0-0.2	44.27	1.32	45.38	7.69	—	—	0.0-0.2	—	—	38.81	5.55
Fd	0.8-1.0	0.23	0.09	0.23	0.09	0.23	0.09	0.8-1.0	0.23	0.09	0.23	0.09
	0.6-0.8	0.24	0.10	0.24	0.10	0.24	0.10	0.6-0.8	0.24	0.10	0.24	0.10
	0.4-0.6	0.26	0.11	0.26	0.11	0.26	0.10	0.4-0.6	0.24	0.11	0.26	0.10
	0.2-0.4	0.28	0.11	0.28	0.12	0.29	0.12	0.2-0.4	0.22	0.11	0.28	0.11
	0.0-0.2	0.27	0.14	0.46	0.24	—	—	0.0-0.2	—	—	0.25	0.13
Fs	0.8-1.0	0.33	0.17	0.33	0.17	0.33	0.17	0.8-1.0	0.34	0.17	0.33	0.17
	0.6-0.8	0.36	0.16	0.36	0.17	0.37	0.16	0.6-0.8	0.35	0.16	0.36	0.16
	0.4-0.6	0.38	0.15	0.38	0.16	0.38	0.15	0.4-0.6	0.38	0.17	0.38	0.15
	0.2-0.4	0.39	0.15	0.46	0.18	0.36	0.15	0.2-0.4	0.37	0.20	0.38	0.14
	0.0-0.2	0.39	0.10	0.37	0.20	—	—	0.0-0.2	—	—	0.52	0.21
Fv	0.8-1.0	0.44	0.18	0.43	0.18	0.44	0.18	0.8-1.0	0.43	0.18	0.44	0.18
	0.6-0.8	0.39	0.17	0.40	0.17	0.39	0.17	0.6-0.8	0.41	0.18	0.39	0.17
	0.4-0.6	0.36	0.15	0.36	0.16	0.35	0.15	0.4-0.6	0.37	0.17	0.36	0.15
	0.2-0.4	0.33	0.13	0.26	0.13	0.34	0.14	0.2-0.4	0.39	0.19	0.34	0.13
	0.0-0.2	0.33	0.05	0.17	0.04	—	—	0.0-0.2	—	—	0.22	0.08

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-6. SE Chip 6: Rosedale Cemetery

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15012	100%	15012	100%	15012	100%	0.0-1.0	15012	100%	15012	100%
N_5	0.8-1.0	10723	71%	11190	75%	10181	68%	0.8-1.0	11331	75%	10089	67%
N_4	0.6-0.8	3441	23%	3216	21%	3872	26%	0.6-0.8	3122	21%	3899	26%
N_3	0.4-0.6	776	5%	559	4%	844	6%	0.4-0.6	512	3%	909	6%
N_2	0.2-0.4	70	0%	47	0%	115	1%	0.2-0.4	47	0%	113	1%
N_1	0.0-0.2	2	0%	0	0%	0	0%	0.0-0.2	0	0%	2	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.60	0.12	0.60	0.12	0.60	0.12	0.8-1.0	0.59	0.12	0.60	0.12
	0.6-0.8	0.56	0.11	0.57	0.11	0.57	0.11	0.6-0.8	0.58	0.12	0.57	0.12
	0.4-0.6	0.52	0.09	0.55	0.10	0.53	0.09	0.4-0.6	0.58	0.11	0.53	0.10
	0.2-0.4	0.52	0.09	0.56	0.09	0.55	0.09	0.2-0.4	0.56	0.10	0.52	0.09
	0.0-0.2	0.55	0.00	—	—	—	—	0.0-0.2	—	—	0.48	0.07
A	0.8-1.0	44.21	3.28	44.30	3.26	44.17	3.32	0.8-1.0	44.14	3.31	44.25	3.31
	0.6-0.8	44.14	3.44	43.92	3.39	44.28	3.29	0.6-0.8	44.34	3.31	44.04	3.33
	0.4-0.6	44.48	3.43	44.06	3.91	44.22	3.42	0.4-0.6	44.80	3.51	44.50	3.39
	0.2-0.4	44.56	3.32	45.27	4.51	45.22	4.07	0.2-0.4	47.52	4.12	44.95	3.63
	0.0-0.2	40.72	1.17	—	—	—	—	0.0-0.2	—	—	39.98	0.90
Fd	0.8-1.0	0.27	0.11	0.27	0.11	0.27	0.11	0.8-1.0	0.28	0.11	0.27	0.11
	0.6-0.8	0.29	0.11	0.29	0.11	0.29	0.11	0.6-0.8	0.28	0.11	0.29	0.11
	0.4-0.6	0.34	0.11	0.32	0.12	0.32	0.11	0.4-0.6	0.28	0.11	0.32	0.11
	0.2-0.4	0.34	0.12	0.31	0.11	0.33	0.12	0.2-0.4	0.28	0.09	0.34	0.12
	0.0-0.2	0.28	0.04	—	—	—	—	0.0-0.2	—	—	0.21	0.06
Fs	0.8-1.0	0.34	0.13	0.34	0.13	0.34	0.13	0.8-1.0	0.35	0.13	0.34	0.13
	0.6-0.8	0.37	0.13	0.37	0.13	0.36	0.13	0.6-0.8	0.35	0.13	0.37	0.13
	0.4-0.6	0.39	0.12	0.38	0.12	0.38	0.12	0.4-0.6	0.34	0.13	0.38	0.12
	0.2-0.4	0.39	0.12	0.37	0.16	0.35	0.13	0.2-0.4	0.30	0.16	0.38	0.12
	0.0-0.2	0.47	0.03	—	—	—	—	0.0-0.2	—	—	0.55	0.01
Fv	0.8-1.0	0.39	0.18	0.38	0.18	0.39	0.18	0.8-1.0	0.37	0.18	0.39	0.18
	0.6-0.8	0.34	0.17	0.34	0.17	0.35	0.17	0.6-0.8	0.37	0.18	0.34	0.17
	0.4-0.6	0.28	0.12	0.30	0.15	0.29	0.13	0.4-0.6	0.38	0.19	0.30	0.13
	0.2-0.4	0.27	0.12	0.32	0.13	0.32	0.14	0.2-0.4	0.42	0.16	0.28	0.12
	0.0-0.2	0.25	0.00	—	—	—	—	0.0-0.2	—	—	0.24	0.07

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-7. SE Chip 7: High Density Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14472	100%	14472	100%	14472	100%	0.0-1.0	14472	100%	14472	100%
N_5	0.8-1.0	9504	66%	10497	73%	9140	63%	0.8-1.0	10907	75%	9155	63%
N_4	0.6-0.8	4008	28%	3334	23%	4208	29%	0.6-0.8	3020	21%	4215	29%
N_3	0.4-0.6	844	6%	593	4%	980	7%	0.4-0.6	512	4%	970	7%
N_2	0.2-0.4	114	1%	48	0%	141	1%	0.2-0.4	31	0%	128	1%
N_1	0.0-0.2	2	0%	0	0%	3	0%	0.0-0.2	2	0%	4	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.51	0.09	0.51	0.09	0.51	0.09	0.8-1.0	0.51	0.09	0.51	0.09
	0.6-0.8	0.50	0.08	0.50	0.09	0.50	0.08	0.6-0.8	0.50	0.09	0.50	0.08
	0.4-0.6	0.49	0.08	0.50	0.09	0.49	0.07	0.4-0.6	0.50	0.09	0.49	0.08
	0.2-0.4	0.48	0.07	0.51	0.08	0.48	0.06	0.2-0.4	0.48	0.08	0.48	0.07
	0.0-0.2	0.47	0.07	—	—	0.44	0.02	0.0-0.2	0.46	0.01	0.50	0.06
A	0.8-1.0	45.27	3.11	45.31	3.06	45.29	3.13	0.8-1.0	45.28	3.12	45.24	3.15
	0.6-0.8	45.53	3.23	45.66	3.29	45.55	3.16	0.6-0.8	45.76	3.16	45.63	3.15
	0.4-0.6	46.24	2.94	45.73	3.51	45.86	3.05	0.4-0.6	46.10	3.00	45.92	2.91
	0.2-0.4	46.46	2.15	46.27	3.21	46.01	2.59	0.2-0.4	46.83	3.29	46.67	2.18
	0.0-0.2	48.48	1.62	—	—	46.22	0.72	0.0-0.2	51.56	0.55	47.88	1.18
Fd	0.8-1.0	0.42	0.12	0.42	0.12	0.42	0.13	0.8-1.0	0.42	0.12	0.42	0.13
	0.6-0.8	0.43	0.13	0.44	0.13	0.44	0.12	0.6-0.8	0.44	0.13	0.44	0.12
	0.4-0.6	0.46	0.12	0.44	0.13	0.45	0.11	0.4-0.6	0.45	0.12	0.45	0.11
	0.2-0.4	0.49	0.08	0.44	0.13	0.46	0.10	0.2-0.4	0.47	0.12	0.48	0.09
	0.0-0.2	0.53	0.01	—	—	0.49	0.04	0.0-0.2	0.55	0.04	0.46	0.04
Fs	0.8-1.0	0.36	0.09	0.36	0.09	0.36	0.09	0.8-1.0	0.37	0.10	0.37	0.10
	0.6-0.8	0.36	0.10	0.36	0.10	0.36	0.10	0.6-0.8	0.35	0.10	0.36	0.10
	0.4-0.6	0.34	0.09	0.36	0.10	0.35	0.10	0.4-0.6	0.34	0.09	0.35	0.10
	0.2-0.4	0.32	0.07	0.35	0.08	0.34	0.09	0.2-0.4	0.34	0.08	0.32	0.07
	0.0-0.2	0.25	0.02	—	—	0.36	0.02	0.0-0.2	0.29	0.02	0.32	0.03
Fv	0.8-1.0	0.22	0.10	0.22	0.10	0.22	0.10	0.8-1.0	0.21	0.10	0.22	0.10
	0.6-0.8	0.21	0.10	0.21	0.10	0.21	0.09	0.6-0.8	0.21	0.10	0.20	0.09
	0.4-0.6	0.20	0.09	0.21	0.10	0.20	0.09	0.4-0.6	0.21	0.10	0.20	0.09
	0.2-0.4	0.19	0.07	0.22	0.09	0.20	0.08	0.2-0.4	0.19	0.09	0.20	0.08
	0.0-0.2	0.22	0.03	—	—	0.15	0.04	0.0-0.2	0.17	0.01	0.22	0.03

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-8. SE Chip 8: Lake

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	12744	100%	12744	100%	12744	100%	0.0-1.0	12744	100%	12744	100%
N_5	0.8-1.0	10111	79%	10113	79%	9436	74%	0.8-1.0	10304	81%	9628	76%
N_4	0.6-0.8	2242	18%	2259	18%	2795	22%	0.6-0.8	2111	17%	2632	21%
N_3	0.4-0.6	354	3%	330	3%	448	4%	0.4-0.6	311	2%	427	3%
N_2	0.2-0.4	34	0%	41	0%	61	0%	0.2-0.4	18	0%	55	0%
N_1	0.0-0.2	3	0%	1	0%	4	0%	0.0-0.2	0	0%	2	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.74	0.05	0.74	0.05	0.74	0.05	0.8-1.0	0.74	0.05	0.74	0.05
	0.6-0.8	0.73	0.06	0.73	0.06	0.73	0.05	0.6-0.8	0.74	0.06	0.73	0.06
	0.4-0.6	0.72	0.07	0.71	0.09	0.72	0.07	0.4-0.6	0.73	0.06	0.72	0.07
	0.2-0.4	0.59	0.17	0.61	0.14	0.64	0.15	0.2-0.4	0.74	0.05	0.64	0.15
	0.0-0.2	0.47	0.18	0.62	0.00	0.48	0.14	0.0-0.2	—	—	0.48	0.19
A	0.8-1.0	45.86	3.58	45.82	3.57	45.82	3.58	0.8-1.0	45.96	3.66	45.82	3.57
	0.6-0.8	46.37	3.89	46.52	3.91	46.33	3.88	0.6-0.8	46.22	3.96	46.27	3.88
	0.4-0.6	47.49	4.52	47.88	4.85	47.41	3.90	0.4-0.6	46.42	3.97	48.03	4.15
	0.2-0.4	53.05	7.65	51.86	6.47	50.97	6.64	0.2-0.4	46.44	2.98	51.67	6.36
	0.0-0.2	58.97	6.96	52.80	0.00	58.15	5.60	0.0-0.2	—	—	57.91	7.23
Fd	0.8-1.0	0.15	0.09	0.15	0.09	0.15	0.09	0.8-1.0	0.15	0.09	0.15	0.09
	0.6-0.8	0.16	0.11	0.17	0.11	0.16	0.10	0.6-0.8	0.15	0.11	0.16	0.10
	0.4-0.6	0.21	0.14	0.21	0.15	0.20	0.13	0.4-0.6	0.16	0.11	0.22	0.13
	0.2-0.4	0.40	0.23	0.38	0.20	0.33	0.21	0.2-0.4	0.16	0.08	0.32	0.21
	0.0-0.2	0.58	0.19	0.49	0.00	0.59	0.11	0.0-0.2	—	—	0.59	0.14
Fs	0.8-1.0	0.20	0.08	0.20	0.08	0.20	0.08	0.8-1.0	0.20	0.08	0.20	0.08
	0.6-0.8	0.19	0.07	0.19	0.07	0.19	0.07	0.6-0.8	0.19	0.07	0.19	0.07
	0.4-0.6	0.18	0.07	0.18	0.06	0.18	0.06	0.4-0.6	0.19	0.07	0.18	0.07
	0.2-0.4	0.17	0.06	0.16	0.05	0.17	0.06	0.2-0.4	0.18	0.04	0.16	0.06
	0.0-0.2	0.15	0.01	0.18	0.00	0.16	0.02	0.0-0.2	—	—	0.17	0.02
Fv	0.8-1.0	0.65	0.10	0.65	0.10	0.65	0.10	0.8-1.0	0.65	0.10	0.65	0.10
	0.6-0.8	0.65	0.11	0.64	0.11	0.65	0.11	0.6-0.8	0.66	0.11	0.65	0.11
	0.4-0.6	0.61	0.14	0.61	0.15	0.62	0.13	0.4-0.6	0.65	0.11	0.61	0.13
	0.2-0.4	0.43	0.21	0.46	0.17	0.50	0.18	0.2-0.4	0.65	0.07	0.52	0.21
	0.0-0.2	0.28	0.20	0.33	0.00	0.24	0.09	0.0-0.2	—	—	0.25	0.12

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-9. SE Chip 9: Near-Range Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	8856	100%	8856	100%	8856	100%	0.0-1.0	8856	100%	8856	100%
N_5	0.8-1.0	6986	79%	6816	77%	6470	73%	0.8-1.0	6990	79%	6514	74%
N_4	0.6-0.8	1630	18%	1743	20%	2068	23%	0.6-0.8	1676	19%	2016	23%
N_3	0.4-0.6	227	3%	279	3%	310	4%	0.4-0.6	185	2%	301	3%
N_2	0.2-0.4	13	0%	18	0%	8	0%	0.2-0.4	5	0%	24	0%
N_1	0.0-0.2	0	0%	0	0%	0	0%	0.0-0.2	0	0%	1	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.74	0.04	0.74	0.04	0.74	0.04	0.8-1.0	0.74	0.04	0.74	0.04
	0.6-0.8	0.73	0.04	0.73	0.05	0.73	0.05	0.6-0.8	0.73	0.05	0.73	0.05
	0.4-0.6	0.71	0.06	0.72	0.05	0.73	0.05	0.4-0.6	0.71	0.06	0.72	0.05
	0.2-0.4	0.67	0.06	0.68	0.06	0.71	0.07	0.2-0.4	0.66	0.10	0.68	0.05
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	0.64	0.00
A	0.8-1.0	45.72	3.68	45.73	3.60	45.68	3.72	0.8-1.0	45.69	3.66	45.63	3.66
	0.6-0.8	46.24	3.87	46.24	4.24	46.14	3.86	0.6-0.8	46.15	3.96	46.33	3.88
	0.4-0.6	46.12	4.76	45.71	4.15	46.68	3.63	0.4-0.6	47.56	4.69	46.77	4.47
	0.2-0.4	46.20	7.34	43.91	4.82	49.86	5.25	0.2-0.4	51.95	7.35	43.00	4.31
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	54.51	0.00
Fd	0.8-1.0	0.17	0.07	0.17	0.07	0.17	0.07	0.8-1.0	0.17	0.07	0.17	0.07
	0.6-0.8	0.18	0.08	0.18	0.09	0.18	0.08	0.6-0.8	0.18	0.08	0.18	0.08
	0.4-0.6	0.18	0.10	0.17	0.08	0.19	0.07	0.4-0.6	0.20	0.10	0.19	0.09
	0.2-0.4	0.20	0.14	0.14	0.06	0.21	0.09	0.2-0.4	0.31	0.17	0.13	0.06
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	0.27	0.00
Fs	0.8-1.0	0.20	0.07	0.20	0.07	0.20	0.07	0.8-1.0	0.20	0.07	0.20	0.07
	0.6-0.8	0.20	0.07	0.20	0.07	0.20	0.07	0.6-0.8	0.20	0.07	0.20	0.06
	0.4-0.6	0.21	0.08	0.21	0.07	0.19	0.07	0.4-0.6	0.19	0.07	0.19	0.07
	0.2-0.4	0.22	0.10	0.25	0.09	0.16	0.07	0.2-0.4	0.13	0.08	0.27	0.08
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	0.11	0.00
Fv	0.8-1.0	0.63	0.07	0.63	0.07	0.63	0.07	0.8-1.0	0.63	0.07	0.63	0.07
	0.6-0.8	0.63	0.07	0.62	0.07	0.63	0.07	0.6-0.8	0.62	0.07	0.63	0.07
	0.4-0.6	0.61	0.07	0.61	0.07	0.62	0.07	0.4-0.6	0.61	0.07	0.61	0.07
	0.2-0.4	0.58	0.09	0.60	0.08	0.63	0.05	0.2-0.4	0.56	0.10	0.59	0.08
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	0.63	0.00

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-10. SE Chip 10: Dense Mountain Peaks

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	11448	100%	11448	100%	11448	100%	0.0-1.0	11448	100%	11448	100%
N_5	0.8-1.0	9286	81%	9197	80%	8799	77%	0.8-1.0	9187	80%	9038	79%
N_4	0.6-0.8	1941	17%	2000	17%	2358	21%	0.6-0.8	2024	18%	2121	19%
N_3	0.4-0.6	216	2%	245	2%	281	2%	0.4-0.6	220	2%	280	2%
N_2	0.2-0.4	5	0%	6	0%	10	0%	0.2-0.4	17	0%	9	0%
N_1	0.0-0.2	0	0%	0	0%	0	0%	0.0-0.2	0	0%	0	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.75	0.04	0.75	0.04	0.75	0.04	0.8-1.0	0.75	0.04	0.75	0.04
	0.6-0.8	0.75	0.04	0.75	0.04	0.75	0.04	0.6-0.8	0.75	0.04	0.75	0.04
	0.4-0.6	0.75	0.04	0.74	0.04	0.75	0.03	0.4-0.6	0.75	0.04	0.75	0.04
	0.2-0.4	0.71	0.02	0.74	0.04	0.73	0.04	0.2-0.4	0.75	0.03	0.73	0.03
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
A	0.8-1.0	43.06	3.70	43.02	3.66	42.97	3.68	0.8-1.0	43.00	3.66	43.04	3.64
	0.6-0.8	43.07	3.41	43.24	3.55	43.27	3.54	0.6-0.8	43.22	3.59	43.11	3.63
	0.4-0.6	42.66	3.25	42.66	3.48	43.81	3.20	0.4-0.6	43.66	3.50	43.04	3.71
	0.2-0.4	47.98	3.27	43.93	5.04	42.94	4.50	0.2-0.4	43.34	3.06	42.19	3.94
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fd	0.8-1.0	0.09	0.06	0.09	0.05	0.09	0.05	0.8-1.0	0.09	0.05	0.09	0.05
	0.6-0.8	0.09	0.05	0.09	0.06	0.09	0.06	0.6-0.8	0.09	0.06	0.09	0.06
	0.4-0.6	0.08	0.05	0.09	0.07	0.09	0.05	0.4-0.6	0.10	0.08	0.09	0.06
	0.2-0.4	0.23	0.09	0.13	0.09	0.09	0.08	0.2-0.4	0.11	0.10	0.09	0.08
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fs	0.8-1.0	0.22	0.07	0.22	0.07	0.22	0.07	0.8-1.0	0.22	0.07	0.22	0.07
	0.6-0.8	0.22	0.07	0.21	0.07	0.21	0.07	0.6-0.8	0.21	0.07	0.21	0.07
	0.4-0.6	0.22	0.07	0.23	0.06	0.20	0.06	0.4-0.6	0.21	0.06	0.22	0.07
	0.2-0.4	0.22	0.03	0.20	0.10	0.24	0.06	0.2-0.4	0.21	0.07	0.25	0.05
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fv	0.8-1.0	0.70	0.07	0.70	0.07	0.70	0.07	0.8-1.0	0.70	0.07	0.70	0.07
	0.6-0.8	0.70	0.07	0.70	0.07	0.70	0.07	0.6-0.8	0.70	0.06	0.70	0.07
	0.4-0.6	0.71	0.07	0.69	0.08	0.71	0.06	0.4-0.6	0.70	0.08	0.70	0.07
	0.2-0.4	0.55	0.10	0.68	0.05	0.68	0.05	0.2-0.4	0.68	0.09	0.66	0.04
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-11. SE Chip 11: Near-Range Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	7776	100%	7776	100%	7776	100%	0.0-1.0	7776	100%	7776	100%
N_5	0.8-1.0	6164	79%	6071	78%	5807	75%	0.8-1.0	6067	78%	5717	74%
N_4	0.6-0.8	1441	19%	1498	19%	1736	22%	0.6-0.8	1547	20%	1809	23%
N_3	0.4-0.6	160	2%	191	2%	218	3%	0.4-0.6	157	2%	231	3%
N_2	0.2-0.4	11	0%	16	0%	15	0%	0.2-0.4	5	0%	18	0%
N_1	0.0-0.2	0	0%	0	0%	0	0%	0.0-0.2	0	0%	1	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.74	0.04	0.74	0.04	0.74	0.04	0.8-1.0	0.74	0.04	0.74	0.04
	0.6-0.8	0.73	0.05	0.73	0.05	0.73	0.04	0.6-0.8	0.74	0.04	0.73	0.05
	0.4-0.6	0.71	0.06	0.71	0.07	0.73	0.05	0.4-0.6	0.73	0.05	0.72	0.06
	0.2-0.4	0.64	0.06	0.67	0.06	0.68	0.07	0.2-0.4	0.71	0.06	0.66	0.06
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	0.63	0.00
A	0.8-1.0	44.47	3.37	44.47	3.38	44.34	3.43	0.8-1.0	44.43	3.50	44.37	3.42
	0.6-0.8	44.47	3.62	44.47	3.60	44.72	3.52	0.6-0.8	44.58	3.38	44.65	3.50
	0.4-0.6	44.31	5.31	44.56	4.86	45.66	3.96	0.4-0.6	45.00	3.87	45.45	4.09
	0.2-0.4	49.42	5.92	47.36	6.69	48.81	4.13	0.2-0.4	44.92	2.34	47.71	5.46
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	56.90	0.00
Fd	0.8-1.0	0.09	0.06	0.09	0.06	0.09	0.06	0.8-1.0	0.09	0.06	0.09	0.06
	0.6-0.8	0.10	0.07	0.10	0.07	0.10	0.07	0.6-0.8	0.09	0.06	0.10	0.07
	0.4-0.6	0.11	0.09	0.11	0.09	0.11	0.08	0.4-0.6	0.11	0.08	0.12	0.09
	0.2-0.4	0.25	0.11	0.20	0.14	0.19	0.13	0.2-0.4	0.11	0.06	0.22	0.12
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	0.35	0.00
Fs	0.8-1.0	0.18	0.06	0.18	0.06	0.18	0.06	0.8-1.0	0.18	0.06	0.18	0.06
	0.6-0.8	0.18	0.07	0.18	0.07	0.18	0.06	0.6-0.8	0.17	0.06	0.18	0.07
	0.4-0.6	0.20	0.08	0.19	0.09	0.17	0.06	0.4-0.6	0.17	0.06	0.18	0.07
	0.2-0.4	0.19	0.07	0.18	0.06	0.16	0.06	0.2-0.4	0.17	0.06	0.19	0.06
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	0.14	0.00
Fv	0.8-1.0	0.73	0.08	0.73	0.08	0.73	0.08	0.8-1.0	0.73	0.08	0.73	0.08
	0.6-0.8	0.72	0.09	0.72	0.09	0.73	0.08	0.6-0.8	0.73	0.08	0.72	0.09
	0.4-0.6	0.69	0.10	0.70	0.11	0.72	0.09	0.4-0.6	0.72	0.09	0.70	0.10
	0.2-0.4	0.56	0.10	0.62	0.13	0.65	0.15	0.2-0.4	0.71	0.09	0.59	0.10
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	0.51	0.00

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-12. SE Chip 12: Residential + Mountain Base

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	13392	100%	13392	100%	13392	100%	0.0-1.0	13392	100%	13392	100%
N_5	0.8-1.0	9465	71%	9601	72%	8717	65%	0.8-1.0	10137	76%	8921	67%
N_4	0.6-0.8	3210	24%	3159	24%	3712	28%	0.6-0.8	2787	21%	3590	27%
N_3	0.4-0.6	672	5%	573	4%	879	7%	0.4-0.6	444	3%	800	6%
N_2	0.2-0.4	45	0%	57	0%	82	1%	0.2-0.4	23	0%	80	1%
N_1	0.0-0.2	0	0%	2	0%	2	0%	0.0-0.2	1	0%	1	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.60	0.11	0.60	0.11	0.60	0.11	0.8-1.0	0.59	0.11	0.60	0.11
	0.6-0.8	0.56	0.11	0.57	0.11	0.58	0.11	0.6-0.8	0.58	0.11	0.57	0.11
	0.4-0.6	0.54	0.09	0.54	0.11	0.56	0.10	0.4-0.6	0.57	0.11	0.56	0.10
	0.2-0.4	0.52	0.10	0.52	0.09	0.54	0.09	0.2-0.4	0.48	0.11	0.53	0.09
	0.0-0.2	—	—	0.46	0.00	0.46	0.00	0.0-0.2	0.39	0.00	0.46	0.00
A	0.8-1.0	47.84	4.03	47.90	4.02	47.90	4.16	0.8-1.0	48.02	4.10	47.86	4.11
	0.6-0.8	48.81	4.27	48.63	4.32	48.58	4.01	0.6-0.8	48.49	4.16	48.65	4.10
	0.4-0.6	49.46	4.12	49.72	4.18	48.94	4.05	0.4-0.6	49.26	4.21	49.26	4.00
	0.2-0.4	49.67	3.77	50.74	3.85	48.89	4.03	0.2-0.4	50.41	3.51	49.76	3.94
	0.0-0.2	—	—	52.14	0.73	52.52	0.18	0.0-0.2	57.34	0.00	52.39	0.00
Fd	0.8-1.0	0.39	0.17	0.40	0.17	0.40	0.17	0.8-1.0	0.40	0.17	0.39	0.17
	0.6-0.8	0.45	0.17	0.43	0.18	0.43	0.17	0.6-0.8	0.43	0.18	0.44	0.17
	0.4-0.6	0.49	0.15	0.49	0.17	0.46	0.16	0.4-0.6	0.46	0.18	0.47	0.16
	0.2-0.4	0.51	0.16	0.54	0.14	0.48	0.16	0.2-0.4	0.56	0.15	0.50	0.16
	0.0-0.2	—	—	0.57	0.01	0.60	0.02	0.0-0.2	0.75	0.00	0.62	0.00
Fs	0.8-1.0	0.26	0.09	0.26	0.09	0.26	0.09	0.8-1.0	0.26	0.09	0.26	0.09
	0.6-0.8	0.25	0.09	0.25	0.09	0.25	0.09	0.6-0.8	0.25	0.09	0.25	0.09
	0.4-0.6	0.25	0.08	0.24	0.08	0.26	0.08	0.4-0.6	0.24	0.09	0.25	0.08
	0.2-0.4	0.25	0.08	0.25	0.07	0.26	0.08	0.2-0.4	0.24	0.08	0.24	0.08
	0.0-0.2	—	—	0.34	0.01	0.28	0.07	0.0-0.2	0.13	0.00	0.24	0.00
Fv	0.8-1.0	0.35	0.18	0.34	0.18	0.35	0.18	0.8-1.0	0.34	0.18	0.35	0.18
	0.6-0.8	0.30	0.17	0.31	0.18	0.32	0.17	0.6-0.8	0.32	0.18	0.31	0.17
	0.4-0.6	0.26	0.14	0.27	0.16	0.29	0.16	0.4-0.6	0.30	0.18	0.28	0.15
	0.2-0.4	0.24	0.15	0.21	0.13	0.27	0.16	0.2-0.4	0.19	0.12	0.26	0.15
	0.0-0.2	—	—	0.09	0.00	0.12	0.04	0.0-0.2	0.12	0.00	0.15	0.00

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-13. SE Chip 13: Dense Mountain

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	12204	100%	12204	100%	12204	100%	0.0-1.0	12204	100%	12204	100%
N_5	0.8-1.0	10093	83%	9876	81%	9656	79%	0.8-1.0	9945	81%	9483	78%
N_4	0.6-0.8	1948	16%	2101	17%	2245	18%	0.6-0.8	2023	17%	2449	20%
N_3	0.4-0.6	161	1%	223	2%	271	2%	0.4-0.6	233	2%	263	2%
N_2	0.2-0.4	2	0%	4	0%	32	0%	0.2-0.4	3	0%	9	0%
N_1	0.0-0.2	0	0%	0	0%	0	0%	0.0-0.2	0	0%	0	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.75	0.03	0.75	0.03	0.75	0.03	0.8-1.0	0.75	0.03	0.75	0.03
	0.6-0.8	0.75	0.03	0.75	0.03	0.75	0.03	0.6-0.8	0.75	0.03	0.75	0.03
	0.4-0.6	0.75	0.03	0.75	0.03	0.75	0.03	0.4-0.6	0.75	0.03	0.75	0.03
	0.2-0.4	0.75	0.03	0.74	0.04	0.75	0.03	0.2-0.4	0.74	0.03	0.74	0.02
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
A	0.8-1.0	43.27	2.91	43.26	2.93	43.22	2.92	0.8-1.0	43.23	2.89	43.22	2.92
	0.6-0.8	42.93	2.86	42.99	2.82	43.12	2.83	0.6-0.8	43.09	2.93	43.18	2.85
	0.4-0.6	43.26	2.88	43.22	2.65	43.50	2.82	0.4-0.6	43.48	3.08	43.20	2.86
	0.2-0.4	42.68	3.17	42.02	3.60	46.16	2.45	0.2-0.4	41.31	2.67	44.97	2.43
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fd	0.8-1.0	0.08	0.04	0.08	0.04	0.08	0.04	0.8-1.0	0.08	0.04	0.08	0.04
	0.6-0.8	0.08	0.04	0.08	0.04	0.08	0.04	0.6-0.8	0.08	0.04	0.08	0.04
	0.4-0.6	0.09	0.05	0.08	0.04	0.09	0.05	0.4-0.6	0.08	0.04	0.08	0.05
	0.2-0.4	0.06	0.03	0.09	0.01	0.14	0.06	0.2-0.4	0.07	0.04	0.14	0.04
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fs	0.8-1.0	0.21	0.06	0.21	0.06	0.21	0.06	0.8-1.0	0.21	0.06	0.21	0.06
	0.6-0.8	0.21	0.06	0.21	0.06	0.21	0.06	0.6-0.8	0.21	0.06	0.21	0.06
	0.4-0.6	0.21	0.05	0.20	0.05	0.20	0.06	0.4-0.6	0.20	0.06	0.21	0.06
	0.2-0.4	0.22	0.03	0.23	0.07	0.15	0.05	0.2-0.4	0.26	0.04	0.17	0.04
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—
Fv	0.8-1.0	0.71	0.05	0.71	0.06	0.71	0.05	0.8-1.0	0.71	0.05	0.71	0.05
	0.6-0.8	0.71	0.06	0.71	0.05	0.71	0.05	0.6-0.8	0.71	0.06	0.71	0.05
	0.4-0.6	0.70	0.05	0.71	0.05	0.72	0.05	0.4-0.6	0.72	0.05	0.71	0.05
	0.2-0.4	0.72	0.01	0.68	0.06	0.71	0.05	0.2-0.4	0.66	0.02	0.70	0.02
	0.0-0.2	—	—	—	—	—	—	0.0-0.2	—	—	—	—

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-14. SE Chip 14: Mountain

Co-Polarizations								Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	12960	100%	12960	100%	12960	100%	0.0-1.0	12960	100%	12960	100%
N_5	0.8-1.0	9856	76%	9881	76%	9315	72%	0.8-1.0	10096	78%	9307	72%
N_4	0.6-0.8	2673	21%	2632	20%	3067	24%	0.6-0.8	2514	19%	3077	24%
N_3	0.4-0.6	408	3%	421	3%	521	4%	0.4-0.6	328	3%	528	4%
N_2	0.2-0.4	23	0%	26	0%	55	0%	0.2-0.4	22	0%	48	0%
N_1	0.0-0.2	0	0%	0	0%	2	0%	0.0-0.2	0	0%	0	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.73	0.04	0.73	0.04	0.73	0.04	0.8-1.0	0.73	0.05	0.73	0.04
	0.6-0.8	0.72	0.05	0.73	0.05	0.72	0.05	0.6-0.8	0.73	0.05	0.72	0.05
	0.4-0.6	0.71	0.05	0.70	0.07	0.71	0.05	0.4-0.6	0.72	0.05	0.71	0.05
	0.2-0.4	0.67	0.05	0.68	0.03	0.68	0.05	0.2-0.4	0.73	0.06	0.68	0.05
	0.0-0.2	—	—	—	—	0.59	0.00	0.0-0.2	—	—	—	—
A	0.8-1.0	45.18	2.96	45.20	2.96	45.07	2.96	0.8-1.0	45.15	2.97	45.11	2.97
	0.6-0.8	45.20	3.15	45.11	3.07	45.47	3.05	0.6-0.8	45.25	3.14	45.28	3.05
	0.4-0.6	44.96	3.11	45.07	3.45	45.52	3.20	0.4-0.6	45.37	2.92	45.73	3.10
	0.2-0.4	45.66	2.53	45.00	3.35	44.76	3.08	0.2-0.4	46.11	2.62	45.38	3.16
	0.0-0.2	—	—	—	—	44.69	0.22	0.0-0.2	—	—	—	—
Fd	0.8-1.0	0.15	0.08	0.15	0.08	0.14	0.08	0.8-1.0	0.15	0.08	0.15	0.08
	0.6-0.8	0.16	0.09	0.15	0.09	0.16	0.09	0.6-0.8	0.15	0.08	0.16	0.09
	0.4-0.6	0.17	0.09	0.18	0.11	0.18	0.10	0.4-0.6	0.15	0.08	0.18	0.10
	0.2-0.4	0.24	0.11	0.20	0.08	0.19	0.08	0.2-0.4	0.16	0.07	0.22	0.09
	0.0-0.2	—	—	—	—	0.31	0.01	0.0-0.2	—	—	—	—
Fs	0.8-1.0	0.20	0.06	0.20	0.06	0.20	0.06	0.8-1.0	0.20	0.06	0.20	0.06
	0.6-0.8	0.21	0.07	0.21	0.06	0.20	0.06	0.6-0.8	0.20	0.07	0.21	0.06
	0.4-0.6	0.22	0.07	0.22	0.07	0.21	0.06	0.4-0.6	0.20	0.06	0.21	0.07
	0.2-0.4	0.22	0.04	0.21	0.07	0.24	0.07	0.2-0.4	0.19	0.07	0.23	0.06
	0.0-0.2	—	—	—	—	0.26	0.01	0.0-0.2	—	—	—	—
Fv	0.8-1.0	0.65	0.09	0.65	0.09	0.65	0.09	0.8-1.0	0.65	0.09	0.65	0.09
	0.6-0.8	0.64	0.10	0.64	0.10	0.64	0.10	0.6-0.8	0.65	0.09	0.64	0.10
	0.4-0.6	0.61	0.10	0.61	0.12	0.61	0.10	0.4-0.6	0.64	0.09	0.61	0.11
	0.2-0.4	0.54	0.11	0.59	0.06	0.57	0.11	0.2-0.4	0.65	0.11	0.55	0.10
	0.0-0.2	—	—	—	—	0.44	0.00	0.0-0.2	—	—	—	—

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-15. SE Chip 15: Highway 101

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14040	100%	14040	100%	14040	100%	0.0-1.0	14040	100%	14040	100%
N_5	0.8-1.0	9809	70%	10415	74%	9475	67%	0.8-1.0	10559	75%	9368	67%
N_4	0.6-0.8	3423	24%	3062	22%	3666	26%	0.6-0.8	2949	21%	3749	27%
N_3	0.4-0.6	712	5%	519	4%	787	6%	0.4-0.6	498	4%	822	6%
N_2	0.2-0.4	94	1%	44	0%	112	1%	0.2-0.4	34	0%	101	1%
N_1	0.0-0.2	2	0%	0	0%	0	0%	0.0-0.2	0	0%	0	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.52	0.10	0.51	0.10	0.52	0.10	0.8-1.0	0.51	0.10	0.52	0.10
	0.6-0.8	0.50	0.09	0.50	0.10	0.50	0.09	0.6-0.8	0.51	0.10	0.50	0.09
	0.4-0.6	0.49	0.08	0.50	0.08	0.49	0.08	0.4-0.6	0.50	0.10	0.49	0.08
	0.2-0.4	0.47	0.08	0.52	0.08	0.49	0.07	0.2-0.4	0.49	0.10	0.50	0.07
	0.0-0.2	0.45	0.05	—	—	—	—	0.0-0.2	—	—	—	—
A	0.8-1.0	48.32	3.40	48.34	3.35	48.35	3.43	0.8-1.0	48.30	3.39	48.31	3.42
	0.6-0.8	48.42	3.41	48.34	3.50	48.35	3.37	0.6-0.8	48.53	3.43	48.43	3.37
	0.4-0.6	48.73	3.41	48.84	3.76	48.50	3.39	0.4-0.6	48.62	3.39	48.60	3.32
	0.2-0.4	48.36	3.56	49.57	4.77	48.73	2.83	0.2-0.4	48.83	4.17	48.58	3.46
	0.0-0.2	47.67	1.07	—	—	—	—	0.0-0.2	—	—	—	—
Fd	0.8-1.0	0.49	0.14	0.49	0.14	0.49	0.14	0.8-1.0	0.49	0.14	0.49	0.14
	0.6-0.8	0.50	0.14	0.49	0.14	0.49	0.14	0.6-0.8	0.50	0.14	0.50	0.13
	0.4-0.6	0.52	0.12	0.50	0.13	0.51	0.13	0.4-0.6	0.51	0.16	0.52	0.13
	0.2-0.4	0.51	0.15	0.50	0.15	0.52	0.11	0.2-0.4	0.51	0.16	0.50	0.13
	0.0-0.2	0.51	0.01	—	—	—	—	0.0-0.2	—	—	—	—
Fs	0.8-1.0	0.28	0.09	0.27	0.09	0.27	0.09	0.8-1.0	0.28	0.09	0.27	0.09
	0.6-0.8	0.27	0.09	0.28	0.09	0.27	0.09	0.6-0.8	0.27	0.09	0.27	0.09
	0.4-0.6	0.27	0.09	0.27	0.09	0.27	0.09	0.4-0.6	0.26	0.09	0.27	0.09
	0.2-0.4	0.29	0.09	0.27	0.09	0.28	0.08	0.2-0.4	0.26	0.09	0.28	0.08
	0.0-0.2	0.36	0.02	—	—	—	—	0.0-0.2	—	—	—	—
Fv	0.8-1.0	0.24	0.13	0.24	0.13	0.24	0.13	0.8-1.0	0.24	0.13	0.24	0.13
	0.6-0.8	0.23	0.12	0.23	0.12	0.23	0.12	0.6-0.8	0.23	0.13	0.23	0.12
	0.4-0.6	0.22	0.10	0.22	0.11	0.21	0.10	0.4-0.6	0.23	0.13	0.22	0.11
	0.2-0.4	0.20	0.10	0.23	0.11	0.20	0.09	0.2-0.4	0.23	0.13	0.22	0.10
	0.0-0.2	0.13	0.02	—	—	—	—	0.0-0.2	—	—	—	—

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-16. SE Chip 16: High Density Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	14796	100%	14796	100%	14796	100%	0.0-1.0	14796	100%	14796	100%
N_5	0.8-1.0	9768	66%	10803	73%	9391	63%	0.8-1.0	10997	74%	9458	64%
N_4	0.6-0.8	3930	27%	3384	23%	4213	28%	0.6-0.8	3257	22%	4168	28%
N_3	0.4-0.6	949	6%	556	4%	1048	7%	0.4-0.6	496	3%	1011	7%
N_2	0.2-0.4	147	1%	51	0%	140	1%	0.2-0.4	46	0%	155	1%
N_1	0.0-0.2	2	0%	2	0%	4	0%	0.0-0.2	0	0%	4	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.50	0.08	0.50	0.08	0.50	0.08	0.8-1.0	0.50	0.08	0.50	0.08
	0.6-0.8	0.49	0.08	0.49	0.08	0.49	0.08	0.6-0.8	0.49	0.08	0.49	0.07
	0.4-0.6	0.47	0.07	0.48	0.07	0.48	0.07	0.4-0.6	0.49	0.09	0.47	0.07
	0.2-0.4	0.46	0.07	0.49	0.07	0.46	0.08	0.2-0.4	0.53	0.08	0.46	0.07
	0.0-0.2	0.48	0.09	0.52	0.01	0.51	0.07	0.0-0.2	—	—	0.48	0.07
A	0.8-1.0	44.98	3.16	44.97	3.08	44.91	3.11	0.8-1.0	44.93	3.02	44.94	3.16
	0.6-0.8	45.13	3.03	45.16	3.17	45.22	3.14	0.6-0.8	45.25	3.26	45.19	3.01
	0.4-0.6	45.27	2.90	45.77	3.20	45.47	2.97	0.4-0.6	45.95	3.57	45.25	3.00
	0.2-0.4	45.44	2.80	45.26	2.89	45.59	2.70	0.2-0.4	46.73	3.74	45.89	2.72
	0.0-0.2	46.79	4.95	45.42	0.68	49.58	0.95	0.0-0.2	—	—	47.09	2.98
Fd	0.8-1.0	0.40	0.11	0.40	0.11	0.40	0.11	0.8-1.0	0.40	0.10	0.40	0.11
	0.6-0.8	0.41	0.10	0.41	0.11	0.41	0.11	0.6-0.8	0.41	0.11	0.41	0.10
	0.4-0.6	0.43	0.11	0.44	0.11	0.43	0.11	0.4-0.6	0.41	0.12	0.43	0.11
	0.2-0.4	0.44	0.10	0.42	0.10	0.45	0.10	0.2-0.4	0.39	0.10	0.46	0.10
	0.0-0.2	0.43	0.15	0.39	0.06	0.53	0.05	0.0-0.2	—	—	0.47	0.10
Fs	0.8-1.0	0.39	0.10	0.39	0.10	0.39	0.10	0.8-1.0	0.39	0.10	0.39	0.11
	0.6-0.8	0.39	0.11	0.39	0.10	0.39	0.11	0.6-0.8	0.38	0.11	0.39	0.10
	0.4-0.6	0.38	0.10	0.37	0.10	0.38	0.10	0.4-0.6	0.36	0.12	0.39	0.11
	0.2-0.4	0.37	0.11	0.38	0.11	0.36	0.11	0.2-0.4	0.32	0.11	0.35	0.10
	0.0-0.2	0.29	0.24	0.32	0.03	0.19	0.08	0.0-0.2	—	—	0.30	0.13
Fv	0.8-1.0	0.21	0.10	0.21	0.10	0.21	0.10	0.8-1.0	0.20	0.10	0.21	0.11
	0.6-0.8	0.20	0.10	0.20	0.09	0.20	0.10	0.6-0.8	0.21	0.11	0.20	0.09
	0.4-0.6	0.18	0.08	0.19	0.08	0.19	0.09	0.4-0.6	0.24	0.13	0.19	0.09
	0.2-0.4	0.19	0.07	0.20	0.07	0.19	0.08	0.2-0.4	0.30	0.13	0.19	0.07
	0.0-0.2	0.28	0.09	0.29	0.03	0.28	0.12	0.0-0.2	—	—	0.23	0.10

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-17. SE Chip 17: Oblique Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15012	100%	15012	100%	15012	100%	0.0-1.0	15012	100%	15012	100%
N_5	0.8-1.0	11060	74%	11701	78%	10642	71%	0.8-1.0	11545	77%	10531	70%
N_4	0.6-0.8	3365	22%	2880	19%	3656	24%	0.6-0.8	3010	20%	3705	25%
N_3	0.4-0.6	531	4%	413	3%	628	4%	0.4-0.6	438	3%	698	5%
N_2	0.2-0.4	52	0%	18	0%	85	1%	0.2-0.4	19	0%	67	0%
N_1	0.0-0.2	4	0%	0	0%	1	0%	0.0-0.2	0	0%	11	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.71	0.06	0.71	0.06	0.71	0.06	0.8-1.0	0.71	0.07	0.71	0.06
	0.6-0.8	0.70	0.07	0.70	0.08	0.70	0.07	0.6-0.8	0.70	0.07	0.70	0.07
	0.4-0.6	0.67	0.09	0.68	0.08	0.68	0.09	0.4-0.6	0.69	0.08	0.68	0.09
	0.2-0.4	0.60	0.09	0.73	0.03	0.64	0.10	0.2-0.4	0.68	0.07	0.66	0.09
	0.0-0.2	0.61	0.11	—	—	0.45	0.00	0.0-0.2	—	—	0.62	0.08
A	0.8-1.0	46.74	2.54	46.74	2.54	46.68	2.53	0.8-1.0	46.68	2.57	46.69	2.54
	0.6-0.8	46.69	2.64	46.64	2.70	46.78	2.68	0.6-0.8	46.79	2.59	46.78	2.61
	0.4-0.6	46.39	2.83	46.33	2.83	46.89	2.64	0.4-0.6	47.05	2.74	46.72	2.79
	0.2-0.4	46.29	3.42	46.81	1.89	46.68	3.05	0.2-0.4	48.53	2.92	47.06	3.05
	0.0-0.2	46.98	4.37	—	—	40.47	0.00	0.0-0.2	—	—	48.09	3.59
Fd	0.8-1.0	0.19	0.07	0.19	0.07	0.19	0.07	0.8-1.0	0.19	0.07	0.19	0.07
	0.6-0.8	0.20	0.08	0.20	0.08	0.21	0.08	0.6-0.8	0.20	0.07	0.20	0.08
	0.4-0.6	0.23	0.08	0.20	0.08	0.22	0.08	0.4-0.6	0.19	0.07	0.22	0.08
	0.2-0.4	0.26	0.07	0.18	0.07	0.25	0.07	0.2-0.4	0.20	0.08	0.24	0.07
	0.0-0.2	0.24	0.02	—	—	0.23	0.00	0.0-0.2	—	—	0.22	0.03
Fs	0.8-1.0	0.20	0.08	0.20	0.08	0.20	0.08	0.8-1.0	0.20	0.08	0.20	0.08
	0.6-0.8	0.21	0.09	0.21	0.09	0.21	0.09	0.6-0.8	0.20	0.09	0.21	0.09
	0.4-0.6	0.23	0.11	0.22	0.09	0.21	0.10	0.4-0.6	0.21	0.09	0.22	0.11
	0.2-0.4	0.25	0.15	0.21	0.05	0.23	0.13	0.2-0.4	0.19	0.09	0.21	0.13
	0.0-0.2	0.20	0.20	—	—	0.51	0.00	0.0-0.2	—	—	0.17	0.16
Fv	0.8-1.0	0.61	0.10	0.61	0.10	0.61	0.10	0.8-1.0	0.60	0.10	0.61	0.10
	0.6-0.8	0.59	0.12	0.59	0.12	0.59	0.12	0.6-0.8	0.60	0.11	0.59	0.12
	0.4-0.6	0.54	0.13	0.58	0.12	0.57	0.13	0.4-0.6	0.60	0.12	0.55	0.14
	0.2-0.4	0.49	0.16	0.62	0.06	0.51	0.15	0.2-0.4	0.61	0.13	0.55	0.14
	0.0-0.2	0.56	0.20	—	—	0.26	0.00	0.0-0.2	—	—	0.61	0.17

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-18. SE Chip 18: Residential (square)

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15120	100%	15120	100%	15120	100%	0.0-1.0	15120	100%	15120	100%
N_5	0.8-1.0	9950	66%	10977	73%	9594	63%	0.8-1.0	11251	74%	9236	61%
N_4	0.6-0.8	4070	27%	3404	23%	4390	29%	0.6-0.8	3361	22%	4526	30%
N_3	0.4-0.6	952	6%	646	4%	978	6%	0.4-0.6	483	3%	1152	8%
N_2	0.2-0.4	140	1%	88	1%	152	1%	0.2-0.4	25	0%	194	1%
N_1	0.0-0.2	8	0%	5	0%	6	0%	0.0-0.2	0	0%	12	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.54	0.09	0.53	0.09	0.53	0.09	0.8-1.0	0.53	0.09	0.53	0.09
	0.6-0.8	0.51	0.09	0.52	0.09	0.52	0.09	0.6-0.8	0.52	0.09	0.52	0.09
	0.4-0.6	0.50	0.09	0.51	0.09	0.51	0.08	0.4-0.6	0.52	0.10	0.50	0.08
	0.2-0.4	0.50	0.08	0.48	0.10	0.48	0.08	0.2-0.4	0.55	0.08	0.49	0.08
	0.0-0.2	0.49	0.10	0.50	0.07	0.38	0.03	0.0-0.2	—	—	0.46	0.10
A	0.8-1.0	42.46	3.03	42.54	2.98	42.46	3.06	0.8-1.0	42.43	2.99	42.44	3.00
	0.6-0.8	42.55	3.00	42.41	3.06	42.52	2.98	0.6-0.8	42.62	3.14	42.58	3.07
	0.4-0.6	42.58	3.08	42.15	3.35	42.65	2.90	0.4-0.6	43.19	3.02	42.56	3.00
	0.2-0.4	42.75	3.48	42.35	4.26	42.92	3.09	0.2-0.4	44.23	3.51	42.68	3.16
	0.0-0.2	43.81	4.85	38.42	6.07	48.60	1.12	0.0-0.2	—	—	45.03	4.71
Fd	0.8-1.0	0.25	0.09	0.26	0.09	0.25	0.09	0.8-1.0	0.26	0.09	0.25	0.09
	0.6-0.8	0.26	0.09	0.26	0.09	0.26	0.09	0.6-0.8	0.26	0.09	0.26	0.09
	0.4-0.6	0.27	0.09	0.27	0.09	0.27	0.09	0.4-0.6	0.26	0.09	0.27	0.09
	0.2-0.4	0.28	0.11	0.28	0.13	0.30	0.10	0.2-0.4	0.23	0.06	0.28	0.10
	0.0-0.2	0.34	0.18	0.23	0.10	0.56	0.05	0.0-0.2	—	—	0.40	0.15
Fs	0.8-1.0	0.43	0.11	0.43	0.11	0.43	0.11	0.8-1.0	0.44	0.11	0.43	0.11
	0.6-0.8	0.44	0.11	0.44	0.11	0.44	0.11	0.6-0.8	0.43	0.11	0.44	0.11
	0.4-0.6	0.45	0.11	0.45	0.11	0.44	0.11	0.4-0.6	0.42	0.11	0.45	0.11
	0.2-0.4	0.43	0.13	0.46	0.14	0.44	0.11	0.2-0.4	0.37	0.12	0.45	0.12
	0.0-0.2	0.38	0.13	0.51	0.13	0.25	0.06	0.0-0.2	—	—	0.34	0.15
Fv	0.8-1.0	0.32	0.11	0.31	0.11	0.32	0.12	0.8-1.0	0.31	0.11	0.32	0.11
	0.6-0.8	0.30	0.11	0.30	0.11	0.30	0.11	0.6-0.8	0.31	0.12	0.30	0.11
	0.4-0.6	0.28	0.10	0.28	0.11	0.29	0.10	0.4-0.6	0.32	0.12	0.28	0.10
	0.2-0.4	0.29	0.11	0.26	0.12	0.27	0.09	0.2-0.4	0.39	0.13	0.27	0.10
	0.0-0.2	0.27	0.08	0.26	0.11	0.20	0.02	0.0-0.2	—	—	0.26	0.13

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-19. SE Chip 19: Residential with cul-de-sacs

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15336	100%	15336	100%	15336	100%	0.0-1.0	15336	100%	15336	100%
N_5	0.8-1.0	10654	69%	11512	75%	10555	69%	0.8-1.0	11781	77%	10015	65%
N_4	0.6-0.8	3665	24%	3244	21%	3886	25%	0.6-0.8	3037	20%	4200	27%
N_3	0.4-0.6	873	6%	524	3%	783	5%	0.4-0.6	465	3%	950	6%
N_2	0.2-0.4	142	1%	55	0%	106	1%	0.2-0.4	53	0%	162	1%
N_1	0.0-0.2	2	0%	1	0%	6	0%	0.0-0.2	0	0%	9	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.67	0.11	0.66	0.11	0.67	0.11	0.8-1.0	0.66	0.11	0.67	0.11
	0.6-0.8	0.63	0.12	0.64	0.12	0.64	0.12	0.6-0.8	0.64	0.12	0.64	0.12
	0.4-0.6	0.59	0.11	0.61	0.12	0.59	0.12	0.4-0.6	0.64	0.12	0.60	0.12
	0.2-0.4	0.54	0.09	0.56	0.13	0.57	0.08	0.2-0.4	0.63	0.11	0.56	0.10
	0.0-0.2	0.47	0.15	0.52	0.00	0.49	0.11	0.0-0.2	—	—	0.51	0.09
A	0.8-1.0	45.53	4.19	45.46	4.22	45.41	4.22	0.8-1.0	45.27	4.23	45.54	4.19
	0.6-0.8	44.81	4.40	44.72	4.30	45.07	4.29	0.6-0.8	45.10	4.35	44.88	4.40
	0.4-0.6	44.17	4.12	44.47	4.49	44.35	4.42	0.4-0.6	45.94	4.25	44.35	4.05
	0.2-0.4	43.39	4.24	43.59	4.90	44.22	4.28	0.2-0.4	46.05	4.81	43.39	4.10
	0.0-0.2	40.68	8.55	41.27	0.00	41.56	7.65	0.0-0.2	—	—	43.86	4.67
Fd	0.8-1.0	0.21	0.07	0.21	0.07	0.21	0.07	0.8-1.0	0.21	0.07	0.21	0.07
	0.6-0.8	0.21	0.08	0.21	0.08	0.21	0.08	0.6-0.8	0.21	0.08	0.22	0.08
	0.4-0.6	0.22	0.09	0.22	0.09	0.23	0.08	0.4-0.6	0.22	0.09	0.22	0.08
	0.2-0.4	0.23	0.08	0.23	0.08	0.24	0.09	0.2-0.4	0.22	0.09	0.22	0.08
	0.0-0.2	0.21	0.05	0.29	0.00	0.25	0.12	0.0-0.2	—	—	0.25	0.08
Fs	0.8-1.0	0.27	0.16	0.28	0.16	0.28	0.16	0.8-1.0	0.29	0.16	0.27	0.16
	0.6-0.8	0.31	0.17	0.31	0.17	0.31	0.17	0.6-0.8	0.30	0.17	0.31	0.17
	0.4-0.6	0.36	0.17	0.33	0.17	0.35	0.18	0.4-0.6	0.28	0.17	0.35	0.17
	0.2-0.4	0.42	0.16	0.39	0.19	0.38	0.15	0.2-0.4	0.29	0.17	0.41	0.16
	0.0-0.2	0.52	0.23	0.52	0.00	0.47	0.24	0.0-0.2	—	—	0.42	0.16
Fv	0.8-1.0	0.52	0.17	0.51	0.17	0.52	0.17	0.8-1.0	0.50	0.17	0.52	0.17
	0.6-0.8	0.47	0.18	0.48	0.18	0.48	0.18	0.6-0.8	0.49	0.18	0.48	0.18
	0.4-0.6	0.42	0.16	0.44	0.18	0.42	0.18	0.4-0.6	0.50	0.18	0.43	0.17
	0.2-0.4	0.35	0.13	0.38	0.19	0.38	0.12	0.2-0.4	0.49	0.17	0.37	0.14
	0.0-0.2	0.26	0.18	0.20	0.00	0.28	0.15	0.0-0.2	—	—	0.33	0.10

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Table C-20. SE Chip 20: High Density Residential

	Co-Polarizations							Cross-Polarizations				
		Pol 1		Pol 2		Pol 3			Pol A		Pol B	
	Range	*Num.*	*%Tot*	*Num.*	*%Tot*	*Num.*	*%Tot*	*Range*	*Num.*	*%Tot*	*Num.*	*%Tot*
N	0.0-1.0	15336	100%	15336	100%	15336	100%	0.0-1.0	15336	100%	15336	100%
N_5	0.8-1.0	9977	65%	11139	73%	9999	65%	0.8-1.0	11484	75%	9451	62%
N_4	0.6-0.8	4214	27%	3574	23%	4138	27%	0.6-0.8	3204	21%	4522	29%
N_3	0.4-0.6	989	6%	578	4%	1061	7%	0.4-0.6	607	4%	1165	8%
N_2	0.2-0.4	144	1%	45	0%	128	1%	0.2-0.4	40	0%	187	1%
N_1	0.0-0.2	12	0%	0	0%	10	0%	0.0-0.2	1	0%	11	0%
	Range	*μ*	*σ*	*μ*	*σ*	*μ*	*σ*	*Range*	*μ*	*σ*	*μ*	*σ*
H	0.8-1.0	0.56	0.09	0.56	0.09	0.56	0.09	0.8-1.0	0.56	0.09	0.56	0.09
	0.6-0.8	0.55	0.09	0.55	0.09	0.54	0.08	0.6-0.8	0.55	0.09	0.54	0.09
	0.4-0.6	0.53	0.08	0.55	0.08	0.53	0.08	0.4-0.6	0.54	0.08	0.53	0.08
	0.2-0.4	0.49	0.08	0.57	0.08	0.50	0.09	0.2-0.4	0.47	0.11	0.51	0.08
	0.0-0.2	0.42	0.10	—	—	0.40	0.09	0.0-0.2	0.46	0.00	0.41	0.10
A	0.8-1.0	42.18	3.10	42.24	3.00	42.19	3.11	0.8-1.0	42.13	3.05	42.18	3.07
	0.6-0.8	42.19	3.06	42.02	3.15	42.10	3.04	0.6-0.8	42.25	3.13	42.15	3.13
	0.4-0.6	42.01	3.01	41.70	3.82	42.26	2.93	0.4-0.6	42.45	3.47	42.11	3.06
	0.2-0.4	41.84	2.65	42.84	4.84	42.04	3.11	0.2-0.4	43.12	2.73	42.44	2.76
	0.0-0.2	42.80	1.78	—	—	44.12	1.63	0.0-0.2	48.33	0.00	43.05	1.45
Fd	0.8-1.0	0.21	0.07	0.21	0.07	0.21	0.07	0.8-1.0	0.21	0.07	0.21	0.07
	0.6-0.8	0.21	0.08	0.21	0.08	0.21	0.07	0.6-0.8	0.21	0.08	0.21	0.07
	0.4-0.6	0.21	0.08	0.21	0.08	0.21	0.08	0.4-0.6	0.21	0.08	0.21	0.08
	0.2-0.4	0.21	0.07	0.23	0.09	0.21	0.08	0.2-0.4	0.21	0.07	0.23	0.08
	0.0-0.2	0.24	0.08	—	—	0.27	0.07	0.0-0.2	0.32	0.00	0.24	0.08
Fs	0.8-1.0	0.43	0.12	0.43	0.12	0.43	0.12	0.8-1.0	0.43	0.12	0.43	0.12
	0.6-0.8	0.44	0.12	0.44	0.12	0.44	0.11	0.6-0.8	0.44	0.12	0.44	0.12
	0.4-0.6	0.46	0.11	0.45	0.12	0.45	0.11	0.4-0.6	0.44	0.13	0.45	0.12
	0.2-0.4	0.49	0.11	0.38	0.14	0.48	0.12	0.2-0.4	0.46	0.08	0.46	0.11
	0.0-0.2	0.47	0.11	—	—	0.44	0.07	0.0-0.2	0.34	0.00	0.49	0.11
Fv	0.8-1.0	0.36	0.11	0.36	0.11	0.36	0.11	0.8-1.0	0.36	0.11	0.36	0.11
	0.6-0.8	0.35	0.11	0.35	0.11	0.35	0.11	0.6-0.8	0.36	0.11	0.35	0.11
	0.4-0.6	0.34	0.10	0.34	0.11	0.34	0.10	0.4-0.6	0.36	0.12	0.34	0.10
	0.2-0.4	0.30	0.09	0.39	0.12	0.31	0.10	0.2-0.4	0.33	0.09	0.32	0.10
	0.0-0.2	0.29	0.06	—	—	0.30	0.03	0.0-0.2	0.33	0.00	0.27	0.05

All Polarizations given for values of degrees of ellipticity and orientation angles (χ, ψ):
Pol 1: (0,0) co-pol. [HH]; Pol 2: (0,90) co-pol. [VV]; Pol 3: (-45,0) co-pol. [RR];
Pol A: (0,0) cx-pol. [VH]; Pol B: (15,45) cx-pol.

Appendix D: Scene cm5439 Spatial Entities in Master Coordinates

The chips discussed in Section Chapter 2 can also be described in coordinates that refer back to the entire scene cm5439. These coordinates follow:

Table D-1. Master coordinates of cropped scene and chips.

	Master Coordinates of Cropped Scene						
	Upper Left Corner		*Lower Right Corner*		*Mcrop*	*Ncrop*	
Scene	Row Pixel	Column Pixel	Row Pixel	Column Pixel	Row Pixels	Column Pixels	**Notes**
CM5439	1	5501	2560	6100	2560	600	LA Redline Area, Crop A

	Master Coordinates of Chip						
	Upper Left Corner		*Lower Right Corner*		*Mchip*	*Nchip*	
Chip	Row Pixel	Column Pixel	Row Pixel	Column Pixel	Row Pixels	Column Pixels	**Notes**
1	1223	5942	1355	6049	133	108	Golf Course
2	1530	5930	1666	6037	137	108	Oblique Residential
3	486	5702	598	5809	113	108	Dense Mountain Peaks
4	1029	5808	1158	5915	130	108	Hollywood Forever Memorial Park
5	2154	5501	2294	5608	141	108	Los Angeles Memorial Coliseum
6	1723	5601	1861	5708	139	108	Rosedale Cemetery
7	1274	5637	1407	5744	134	108	High Density Residential
8	577	5940	694	6047	118	108	Lake
9	110	5901	191	6008	82	108	Near-Range Residential
10	358	5876	463	5983	106	108	Dense Mountain Peaks
11	56	5556	127	5663	72	108	Near-Range Residential
12	785	5901	908	6008	124	108	Residential + Mountain Base
13	470	5530	582	5637	113	108	Dense Mountain
14	654	5575	773	5682	120	108	Mountain
15	1029	5668	1158	5775	130	108	Highway 101
16	1528	5608	1664	5715	137	108	High Density Residential
17	1721	5968	1859	6075	139	108	Oblique Residential
18	1978	5708	2117	5815	140	108	Residential (square)
19	2303	5943	2444	6050	142	108	Residential with cul-de-sacs
20	2319	5626	2460	5733	142	108	High Density Residential