

# **NEAR FIELD MICROWAVE IMAGING TECHNIQUES FOR EMBEDDED OBJECT DETECTION AND SHAPE RECONSTRUCTION**

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## **ABSTRACT**

A method for the detection, imaging and reconstruction of an embedded object through the application of a near field, frequency-synthesized microwave pulse is described. The work describes an alternate detection and reconstruction technique called the Single-Probe Imaging through Detection and Reconstruction (SPIDR) method, which uses a single near-field probe to locate the distance from an embedded object and then reconstruct the object's shape. The method described is both experiment and software driven, which carries out extensive data collection and processing computations. For complete image mapping and reconstruction, a combines scanning technique is employed since planar scanning alone cannot provide image reconstruction. The method described is applicable to symmetrical objects which can be extended to non-symmetrical objects through enhanced reconstruction methods.