Public Abstract
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Low and intermediate mass stars (0.8--8 solar masses) will eventually evolve into Asymptotic Giant Branch (AGB) stars and pulsate out their atmosphere into the space around them. That ejected material will eventually cool and form dust. Understanding the nature and formation of cosmic dust is crucial to understanding the Universe. Evolved intermediate mass stars (i.e. AGB stars) are major contributors of dust to the cosmos. Dust around AGB stars are studied by means of infrared spectroscopy from which we observe several interesting spectral features. The observed AGB star spectra have been classified according to their shapes and wavelength positions of the dust features. Alongside the main spectral features around 8-12 microns, there is an enigmatic 13 micron feature that appears in about half the oxygen-rich AGB stars. The carrier of this feature has not yet been unequivocally identified but has been attributed to various dust species, including corundum (crystalline Al_2O_3), spinel ($MgAl_2O_4$), and silica (SiO_2). While there have been several attempts to determine the cause of this 13 micron feature, previous studies have been somewhat contradictory. In order to investigate the origin and characteristics of this spectral feature we observe variations in the 13 micron feature over varying stellar parameters. We have also acquired spatially resolved spectroscopic observations of nearby O-rich AGB stars using Michelle on Gemini North. Here we present data on the 13 micron feature strength mapped over space around their respective AGB star. The most popular hypothesis for the carrier of the 13 micron feature is not supported by our findings.