

USING THE NEAR INFRARED TO PROBE UMBRAL DYNAMICS

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We use the McMath Pierce Solar Telescope in conjunction with the NSO Aladdin Camera (NAC) with adaptive optics to search for a dependence of magneto-hydrodynamic (MHD) wave speeds on the average field strengths in four sunspot umbrae. We measure velocity signals with the Fe I 15648, Fe I 15652 and the molecular OH line at 15650.5. We identify the linear and non-linear characteristics of oscillatory signals and any associated propagation speeds. Since the dominant umbral oscillations are the slow MHD wave, acting similar to a pure acoustic wave, they should not show a dependence on umbral field strength. We test this hypothesis. We obtain high cadence observations to build up a time series of spectropolarimetric data for 4 sunspot umbrae. The near-infrared data is especially interesting because so few sunspot studies have been conducted at this wavelength and it is not adversely affected by scattered light.