3D Radiative Transfer Modeling of the Scattering Polarization in the Wings of Mg II k and h

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The CLASP2 rocket experiment was performed on April 11, 2019. It observed the solar chromosphere in the Mg II resonant doublet near 280 nm for three targets: the quiet Sun at the disk center, at the limb, and an active plage at midway. Slit spectra in all four Stokes parameters were obtained in the UV. The limb target revealed profile shapes for the linear polarization caused by quantum interference in the upper term ^{2}P. Additionally, the linear polarization exhibited spatial variations on the mesogranular scale. This confirmed the theoretical prediction of Stenflo (1980), recently thoroughly investigated by Belluzzi and Trujillo Bueno (2012). We have developed two numerical modules for the PORTA radiative transfer code to interpret these data through forward modeling. We have numerically solved the transfer problem, taking into account the effects of 3D geometry, partial redistribution of scattered photons, and quantum interference in a two-term atom. We will describe the observational experiment, complexities of the theoretical method, computational demands, and our approximations. We will compare synthetic and observed data to show the importance of various effects: spatial symmetry breaking, quantum interference, magneto-optical sensitivity, and instrumental limitations.