

Abstract Submitted  
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**Characterizing Satellites Using Near-Simultaneous Polarization Measurements** AUDRA JENSEN, MICHAEL PLUMMER, FRANCIS CHUN, U.S. Air Force Academy, DAVID STRONG, Strong EO Imaging, Inc — The United States Air Force Academy operates an f/8.2 16-inch telescope fitted with an Andor Alta U47 1024 X 1024 pixel CCD camera and a nine position filter wheel. This telescope was used to observe five clusters of 14 geosynchronous communication satellites on six different nights in the month of March 2020, during what is called the glint season, which is typically during the weeks surrounding the fall and spring equinoxes. Near-simultaneous spectral and polarization images were captured using a 100 lines per millimeter diffraction grating and linear polarization filters (0 degrees, 45 degrees, 90 degrees, 135 degrees). The measured intensities through the linear polarization filters were used to derive output Stokes parameters. A previously determined calibration matrix was used to calculate the input Stokes parameters of the incident light on the optical system. Analysis was then performed on the resulting input Stokes parameters and the associated degree of linear polarization (DOLP) during and before the solar panel glints. Differences in the satellites' Stoke parameters are potentially indicative of different satellite materials or geometries altering the polarization properties of the initially unpolarized sunlight. Detailed analysis aims to provide relationships between satellite systems based on processed data.

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