M03a   Verification of CLASP2's Polarization Accuracy

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Chromospheric LAyer Spectro-Polarimeter (CLASP2) is a sounding rocket experiment that on 2019 April 11 successfully measured the four Stokes profiles across the Mg II h & k lines in an active region plage and in a quiet region near the solar limb. For facilitating the inference of the magnetic field in the upper chromosphere, we required an accuracy of 0.1 % in the polarization measurements. To this end, we accurately determined the polarization response matrix of the CLASP2 instrument, finding that for the relevant matrix elements were within 1 % for the levels of scale factor and crosstalk and within 0.017 % for the spurious polarization levels. These response matrix elements were determined by combining the results of the calibration measurements obtained in the laboratory and during the flight. First, we determined the matrix elements of the scale factor and crosstalk, assuming that the spurious polarization levels are zero. Second, we derived the spurious polarization levels accurately using the in-flight data of the solar disk center observations. In this contribution, we give the response matrix of CLASP2 and discuss how accurately the polarization of the Mg II lines can in principle be determined. In addition, we discuss the achieved polarization accuracy of 0.1 % based on the results obtained by correcting the demodulated polarization signals using the CLASP2 response matrix.