M16a   Verification of CLASP2's Polarization Accuracy

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A NASA sounding rocket experiment, Chromospheric LAyer Spectro-Polarimeter (CLASP2), was performed on April 11, 2019, and successfully detected full Stokes profiles of the Mg II h & k lines in a plage region and the quiet Sun near the limb. To obtain the magnetic information in the upper chromosphere, we require the accuracy of 0.1 % in the polarization measurements in these lines. To achieve this requirement, we had to determine the polarization response matrix of the CLASP2 instrument accurately: the matrix elements for scale factor or crosstalk within 1 % and those for spurious polarization within 0.017 %. Then, we carried out the polarization calibration of CLASP2 in two steps as follows. First, we evaluated the elements for scale factor and crosstalk by using an in-house polarization light source with a UV LED lamp. We found non-negligible uncertainties in some elements of scale factor and crosstalk, but the Stokes parameters calculated by them satisfy our required accuracy of 1 %. Next, we estimated the elements for spurious polarization by using the in-flight disk-center observation. We also confirmed that the level of spurious polarization is less than our required tolerance of 0.017 %. In this presentation, we provide the response matrix of CLASP2, and also discuss how accurately we can determine the polarization.