Session 2

Polarization measurement of the O V 121.83 nm intercombination line with CLASP

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The Chromospheric Lyman-Alpha SpectroPolarimeter (CLASP) sounding rocket experiment provided precise polarimetric measurements of far ultraviolet (FUV) emission lines emanating from the solar chromosphere and transition region. The CLASP observation covered linear polarization not only at the optically thick H I Lyman-alpha 121.57 nm line but also at the weaker Si III 120.65 nm line as well as at the even weaker O V 121.83 nm line adjacent to H I Lyman-alpha. The Lyman-alpha wings and THE Si III line exhibit clear center-to-limb variation (CLV) of the fractional linear polarization Q/I, showing a negative increase toward the limb, with a fractional polarization signal of around 4% near the limb (Kano et al. 2017, Ishikawa et al. 2017). The negative Q/I corresponds to polarization perpendicular to the limb, which is consistent with the theoretical prediction where multiple scattering events create the linear polarization when the radiation propagates through the upper chromosphere and the transition region. The O V 121.83 nm line is weak because the line results from an intercombination transition. The CLASP observation indicates the possible existence of linear polarization perpendicular to the limb at the O V line. The fractional linear polarization Q/I is larger than the estimated noise only near the limb and is about 2% when we subtract the influence of the nearby continuum coming from the Lyman-alpha wing. If confirmed, polarization measurements of the OV line might provide a new tool to constrain the density as well as the magnetic field configuration in the upper chromosphere and the transition region.