Session 3

Non-symmetric Radiative Excitation of Polarized Lines in the Upper Atmosphere

T.A. Schad[1], G.I. Dima[2], T. Anan[1], S.A. Jaeggli[1]
[1] NSO, [2] NOAA/CIRES

Forward calculations of polarized scattering in spectral lines formed in the chromosphere and corona often assume an incident radiation field that is unpolarized and cylindrically symmetrical about the radial direction. Treating symmetry-breaking introduced by spots or plage adds complexity to forward models and compounds the existing challenges faced in interpreting observations. Here we discuss recent work aimed at understanding symmetry-breaking effects on coronal forbidden lines, Thomson scattering, and the neutral helium triplet. We briefly introduce a new code called pyCELP that allows flexible calculations of forbidden line polarization, which is then used to model symmetry-breaking effects within a 3D MHD coronal model. We further present a spherical-tensor-based formalism for Thomson scattering that allows easy incorporation of symmetry-breaking in continuum scattering calculations near sunspots. Finally, we will discuss polarimetric observations of He I 1083 nm near sunspots and the role of symmetry breaking on both their intensity and polarized signatures.