

Session 2

Spectropolarimetry of solar prominences in He I 10830 Å with the Domeless Solar Telescope at Hida observatory

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The magnetic field is an important quantity for understanding the properties of solar prominences (or filaments); their structures are determined by magnetic fields, and thermal conduction and Alfvén waves in prominences are controlled by magnetic fields. Polarimetry allows us to measure magnetic fields directly.

A new spectropolarimeter has been developed on DST (Domeless Solar Telescope) at Hida observatory. We observed several prominences in He I 10830 Å with spectral sampling about 0.03 Å. Our observations were made in the slit-scan mode, with the slit parallel to the limb. We integrated 80-100 images of 0.05-second exposure and obtained full Stokes profiles at each slit position. N/S of the polarization signal is 3×10^{-4} with respect to disk continuum, while in prominences N/S is about 1×10^{-3} with respect to peak intensity.

We performed Stokes inversions by using the inversion code HAZEL and constructed 2D maps of magnetic field vectors. As a result, the magnetic field in prominences is mostly between 10 and 20 G, but one of the prominences, which is the active-region prominence, has larger magnetic fields, up to 50 G. In this presentation, we introduce Stokes profiles of a few prominences and inversion results.