

Session 2

(Invited) Chromospheric magnetic field in active regions

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Chromosphere is a dynamic layer in the solar atmosphere where various energetic events occur. Because the plasma beta becomes smaller than unity in the chromospheric layer, the dynamics is thought to be dominated by the magnetic field. It is crucial to infer the chromospheric magnetic field to understand the mechanisms of such energetic events. Recently, chromospheric magnetic field has been measured by spectropolarimetry with ground-based telescopes. We would like to summarize the previous studies focusing on chromospheric magnetic field observations in active regions.

We will report our recent study on the chromospheric magnetic field observations and nonlinear force-free field (NLFFF) extrapolation modeling. One of the assumptions in the NLFFF extrapolation is that the plasma beta is low, but this condition is considered to be incorrect in the photosphere. To evaluate the influence on the modeling due to the boundary condition inconsistency, the results of NLFFF extrapolation from the photosphere observed with Hinode are compared with the spectropolarimetric observations at He I 1083 nm. The comparisons allow quantitative estimation of the NLFFF uncertainty. We found that chromospheric magnetic field may have larger non-potentiality compared to the photospheric magnetic field and the large non-potentiality in the chromospheric height may not be reproduced by the NLFFF extrapolation from the photospheric magnetic field. We will also discuss the prospect of the future chromospheric magnetic field observations.