Session 2

Inference of the chromospheric magnetic field configuration of solar plage using the CaII 8542 angstrom line

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It has so far proven impossible to reproduce all aspects of the solar plage chromosphere in quasi-realistic numerical models. The magnetic field configuration in the lower atmosphere is one of the few free parameters in such simulations. The literature only offers proxy-based estimates of the field strength, as it is difficult to obtain observational constraints in this region. Sufficiently sensitive spectro-polarimetric measurements require a high signal-to-noise ratio, spectral resolution, and cadence, which are at the limit of current capabilities. We use critically sampled spectro-polarimetric observations of the Ca II 8542 Å line obtained with the CRISP instrument of the Swedish 1-m Solar Telescope to study the strength and inclination of the chromospheric magnetic field of a plage region. This will provide direct physics-based estimates of these values, which could aid modelers to put constraints on plage models.

We use a non-local thermodynamic equilibrium inversion code called STIC to infer the atmospheric structure and magnetic field of the region. In the plage we report an absolute field strength of $|B| = 440 \pm 90$ G, with an inclination of $10^\circ \pm 16^\circ$ with respect to the local vertical. This value for $|B|$ is roughly double of what was reported previously, while the inclination matches previous studies done in the photosphere.