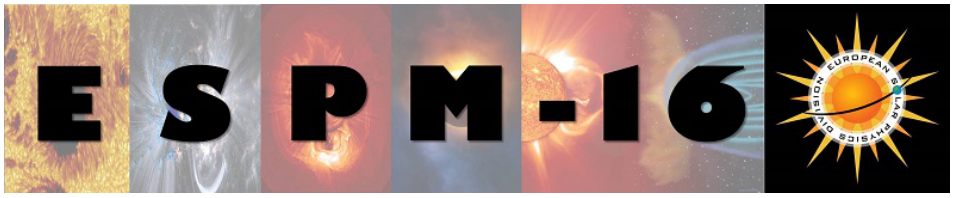


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# Solar prominence diagnostics from non-LTE modeling of Mgii h&k line profiles

*Wednesday, 8 September 2021 10:18 (13 minutes)*

We investigate a new method to obtain the plasma parameters of solar prominences observed in the Mg II h&k spectral lines by comparing line profiles from the IRIS satellite to a bank of profiles computed with a one-dimensional non-LTE radiative transfer code. The prominence observations were carried out by the IRIS satellite on 19th April 2018. Using a grid of 1007 one-dimensional non-LTE radiative transfer models, some including a prominence-corona transition region (PCTR), we are able to recover satisfactory matches in areas of the prominence where single-line profiles are observed. Large values of ionization degree are found by the procedure in areas where the line of sight crosses mostly plasma from the PCTR, correlating with high mean temperatures and correspondingly no Hα emission. The models were unable to recover satisfactory fits in the regions where we see Hα emission. This is due to the complex line shapes manifesting from many unresolved independently moving threads. This issue might be solved in future by increasing the microturbulent velocities in the models to simulate these unresolved movements.

This new method naturally returns information on how closely the observed and computed profiles match, allowing the user to identify areas where no satisfactory match between models and observations can be obtained. The inclusion of the PCTR was found to be important, as regions where satisfactory fits were found were more likely to contain a model encompassing a PCTR.

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