

# **Modelling the solar atmosphere including the magnetic field**

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The lower corona and transition region of the Sun are highly structured through the magnetic field, and are very dynamic. To account for both the structure and the dynamics of the solar atmosphere a 3D MHD model has to be employed. The paper will present recent 3D MHD coronal models and will discuss them with special emphasis on a possible comparison to observations.

Results will be presented for spectra derived from the complex coronal models, which can be treated as synthetic observations. The agreement of these to actual average observations of the solar outer atmosphere is very good, especially with respect to Doppler shifts and the emission measure.

The results from the 3D MHD models will also be compared to modeling stellar atmospheres through a superposition of a large number of individual loops as derived from (potential) field extrapolations. This will show the limitations as well as the potential of such multi-loop models.

Finally the results of modern models of the solar corona will be put into the context of stellar observations and possible future directions in coronal modeling will be discussed.