



Comparison of helioseismic cut-off frequency formulations by the means of MHD simulation results

Philippe-A. Bourdin (1), Irina Thaler (2), and Markus Roth (2)

(1) Space Research Institute, Graz, Austria (philippe.bourdin@oeaw.ac.at), (2) Kiepenheuer-Institut für Sonnenphysik, Freiburg, Germany

The discussion of helioseismic wave phenomena requires a self-consistent description of the plasma pressure. Magnetically active regions on the Sun are observed to have distinct wave phenomena as compared to quiet regions. With better helioseismologic diagnostics near active regions one may also better understand not only the chromospheric energy budget, but also halo formation and running penumbral waves. The line formation height (with respect to the $\beta=1$ level) and the magnetic field inclination near the solar surface are in the same time difficult to measure and important to correctly interpret observations. With the help of a large-scale 3D magneto-hydrodynamic (MHD) model, that features an active region as bottom boundary and has shown good agreement to various observations, we may compute values for theoretically derived formulations of cut-off frequencies from the model plasma parameters. Our results show strongly varying vertical atmospheric profiles and we give estimates of their influence on the expected cut-off frequencies.