

Comparing Radiative Transfer Codes for Synthesis of Solar and Stellar Irradiance

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Different radiative transfer codes employed to reproduce stellar spectra rely on different atomic and molecular databases, as well as on different numerical techniques and approximations. As a result, spectra obtained with different codes may differ significantly, especially in the UV. In this contribution we investigate the effects of employing different codes for irradiance reconstructions focusing in particular on three aspects. First, we present a comparison of NLTE synthesis obtained with FAL atmosphere models representing quiet and magnetic regions using two widely used radiative transfer codes, RH and COSI. Second, we compare spectra synthesized with 3D MHD simulations of the solar atmosphere obtained using binned opacities computed with the ATLAS 9 and with the RH codes, as well as high-resolution synthesis obtained with RH. Finally, we investigate the effects of the use of different opacities for the solution of the MHD equations and for the spectral synthesis.