Contributed Talk

Splinter Plasma

Temperature evolution of solar atmosphere for a nonlocal heat flux

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The heat fux is an important mechanism for energy transport in the weakly collisional plasma of the solar corona. Most of the investigations regarding the thermal dynamics of the upper part of solar atmosphere are based on a collisional formulation for heat flux. However, the contribution from free electrons to the heat transport it is better described when considering a nonlocal heat flux model. To investigate the degree of dependency of the coronal plasma thermal evolution on the heat flux model, we have performed 3D MHD simulations of an active region considering classical (collisional) heat flux and nonlocal models. We have obtained in average similar plasma dynamics for both simulations with main differences appearing in the upper chromosphere/transition region/lower corona. The nonlocal model leads to coronal temperatures two times higher than the classical heat flux along loops which presented more intense currents dissipation. Therefore, our results indicates that the heat flux model considerably affects how the plasma answer to heating mechanisms.