Reconstruction and modeling of quiet-sun coronal loops

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Abstract: The solar corona is structured in the form of magnetic flux tubes or loops. In the case of the quiescent sun, identifying and observing coronal loops becomes a difficult task due to the lack of contrast of the loops with their environment. The Differential Emission Measure Tomographic (DEMT) technique provides a 3D reconstruction of the thermal properties of the coronal plasma from sets of full-sun images in different EUV channels. Combining DEMT results with magnetic field lines integrated from a global potential model of the coronal magnetic field (DEMT-PFSS), we are able to characterize physical parameters of the coronal plasma along reconstructed loops.

In this work we statistically analyze a large number of reconstructed loops for the Carrington Rotation (CR) 2082 which corresponds to the minimum between Solar Cycles 23 and 24. We build typical loops according to different length ranges and we compare their density and temperature profiles with those obtained with the 1D hydrodynamic model \emph{Hydrodynamics and Radiation Code} (HYDRAD), for constant and impulsive heating regimes. We analyze our results in the frame of different models of coronal heating.

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