M08a Alfven wave and Nanoflare heating models, predicting differences in the observational signatures

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Coronal heating problem stands among the most puzzling unsolved astrophysical phenomena, which consists in identifying and understanding the physical mechanism responsible for the few million degree coronal temperatures. The solution involves many steps starting from identifying an energy source, to predicting observable quantities as the spectrum of emitted radiation. Promising coronal heating mechanisms are the Alfven wave heating mechanism in which Alfven waves transport the energy into the corona (Alfven 1947; Hollweg 1982), and the Nanoflare heating mechanism, in which the energy is released through many small reconnection events (Parker 1988; Priest et al. 2002). This work offers a comparison between these two heating mechanisms in the case of a coronal loop using 1.5-D MHD numerical simulations with the CIP-MOCCT scheme (Yabe and Aoki 1991; Evans and Hawley 1988). Following previous works (Moriyasu et al. 2004) in which the Alfven heating model of the loop is presented, we invesigate the hydrodynamic response of a loop heated by nanoflares. We then consider the case of a loop in which nanoflares disturb the magnetic field, comprising both, Alfven wave and nanoflare heating. The observational consequences of each model are investigated predicting the XRT intensity fluxes for Solar-B in order to distinguish the different observable signatures of these two heating mechanisms.