ABSTRACT ONLY

THE EFFECT OF CROSS-SECTION EXPANSION ON THE EVOLUTION OF CORONAL LOOPS

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Solar coronal dynamics is strongly dominated by the magnetic field. The presence of loop structures, observed in Extreme Ultraviolet and X-ray images of active regions, are the most conspicuous manifestations of this. The "frozen-in" condition of the coronal plasma obliges it to flow along magnetic field lines making magnetic strands and loops the basic blocks of the coronal structure. This led, in recent decades, to a growing interest in studying the geometric and dynamic properties of these loops, in particular, in relation to the problem of coronal heating. In this work, we use a one-dimensional hydrodynamic code to analyze how the loop geometry, determined by the expansion factor of its cross-section, affects the evolution of the plasma contained in them. For that, we apply different geometries and heating regimes to modeled loops for later comparison with actual observations. Our preliminary results show that the evolution of the plasma parameters, mainly the density, are remarkably affected by different schemes of cross-section variation along the loops. This, in turn, produces clearly identifiable differences in the observational signatures of the parameters, as can be deduced from the analysis of synthetic spectral lines obtained from the models.

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