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Effect of the Latitudinal Distribution of Temperature at the Coronal Base on the Global Magnetic Field Configuration

SHADIA RIFAI HABBAL[1], BO LI[2], CHRISTOPHER MOUNTFORD[3], XING LI[2]

[1]*Institute for Astronomy, University of Hawaii, Honolulu, HI 96822, USA*
[2]*Institute of Mathematical and Physical Sciences, University of Wales, Aberystwyth, Ceredigion SY23 3BZ, UK*
[3] *University of Leeds, Leeds, UK*

Using a two-dimensional MHD model of the corona and solar wind, we investigate the role of the temperature distribution with latitude at the coronal base on the global magnetic field configuration and solar wind properties at 1AU. The latitudinal distribution of temperature is aimed at modeling the transition from coronal hole to quiet Sun to active regions. The results of the model calculations illustrate how the introduction of latitudinal changes in the base temperature modify the coronal magnetic field configuration, which subsequently impacts the distribution of the wave energy flux in the solar wind, and hence its thermodynamic properties. The sharp temperature changes at the coronal base lead to the formation of current sheets, and modify the location of the cusp of the streamer and the neutral line originating there. They may also lead to the development of Kelvin-Helmholtz instabilities in the outer corona.