Toyama International Symposium on "Physics at the Cosmic Frontier"

Contribution ID: 3

Type: not specified

What regulates temperature anisotropy in the expanding solar wind plasmas?

Saturday 9 March 2019 11:30 (40 minutes)

The solar wind plasmas possess temperature anisotropies that cannot be described by the prediction of doubleadiabatic theory. It is commonly accepted that the pervasive features of temperature anisotropy observed in the solar wind are thought to result from a combination of physical mechanisms including the expansion, turbulent heating, kinetic instabilities, and Coulomb collisions. In this study, we develop an expanding box model of velocity moment-based quasilinear kinetic analysis that includes the above-mentioned physical ingredients. By incorporating the local kinetic physics into the large scale expansion and/or Parker spiral magnetic field in the present model, we describe how the solar wind temperature anisotropy is formed and evolves in interplanetary space.

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