



Energy transfer from the solar wind to the ionosphere: global estimation of Joule heating and particle precipitation.

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The ionospheric convection driven under different orientations and magnitudes of the interplanetary magnetic field is reasonably well understood. However, the changes in the IMF lead to rapid changes in the ionospheric convection which will be responsible for increased energy transport to the ionosphere via Joule heating of the ionospheric plasma and thermospheric gas. In addition, substorms on the nightside result in both enhanced ionospheric convection as well as the well known particle precipitation, thus providing two sources of energy transfer to the ionosphere. In this paper I shall review the nature of the possible sources of energy transfer from the solar wind into the ionosphere, demonstrate how quantitative estimates of these can be made on a global scale, and illustrate the importance of being able to do this for a variety of different modes of interaction between the solar wind, magnetosphere and ionosphere.