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Title: Consequences of the large ambipolar electric field in the solar wind

Authors: [Scudder, J. D.](#)

Affiliation: AA(Iowa University)

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Abstract

The parallel electric field in the solar wind is much smaller than the $V \times B$ motional electric field, yet in the proper dimensions units it is very 'large'. At the orbit of earth it is within a few percent of being at the Dreicer limit. This 'large' electric field is required for quasi-neutrality; it will be shown to have interesting consequences for the electron velocity distribution function and the description of transport of heat. Interestingly, a similar dimensionless situation also occurs at the base of the transition region, while below the transition region the dimensionless electric field is

very weak. These facts suggest a new way to look at the thermal-suprathermal dichotomy in velocity distributions as the response of a plasma where charge neutrality requires such large dimensionless electric fields.

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