



Microstates of the solar wind: Kappa vs. Maxwellian models

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The observations in space plasmas indicate two distinct models for the particle velocity distributions: the standard Maxwellian for the core populations, and the Kappa power-law for the high-energy (suprathermal) tails. But the attempts to describe the dispersion and stability properties of these plasma systems are limited to simplified models, which either consider the core bi-Maxwellian and ignore suprathermal populations, or minimize the core assuming this component cold and model suprathermal tails with Kappa power-laws. Worthwhile is to assess to which extent these distribution functions are applicable in realistic situations. Here we present a comparative analysis based on the functional relationships between Kappa and Maxwellian models associated with the same microstate of the plasma. Theoretical models are tested with the empirical models indicated by the observations in the solar wind.