Cumulative instabilities of the solar wind electron core and halo temperature anisotropies, and their drift velocities

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In-situ measurements reveal two central components, i.e. thermal bi-Maxwellian core and a bi-Kappa suprathermal halo, forming the electron velocity distribution in the solar wind. These components may exhibit temperature anisotropies, which destabilize the electron anisotropy-driven instabilities and core-halo relative velocity, which destabilize heat flux instabilities. In the existing studies these two sources of free energy and the resulting instabilities are investigated independent of each other. Here we present the results of an advanced study of the interplay of kinetic instabilities driven by the cumulative effect of relative drifting components and their intrinsic temperature anisotropies. Such complex analysis leads to an important number of various regimes of instability, and distinguishing between them becomes highly demanding.