Abstract

In situ measurements reported with different space-crafts reveal the constraints on temperatures of solar wind species. Out of the different phenomenon, temperature anisotropy-driven instabilities are investigated as key mechanism for the regulation of an unchecked rise of temperature in dilute space plasma limits. The present study considers the excitation of O-mode instability under the excessive electrons parallel temperature condition i.e., $T_{\parallel e} > T_{\perp e}$. Keeping in view the realistic scenario of expending solar wind, a dual core/halo electrons distributions model is employed. Utilizing Vlasov-Maxwell's model, a dispersion relation is derived whose numerical solution characterizes the growth rate of O-mode instability. Based on observed solar wind electrons data, a series of anisotropic conditions of core/halo electrons is adopted to highlight the features of excited mode. A rise in the growth rate is represented with the increase of anisotropic ratios associated either with core electrons or halo electrons and or with both components of the solar wind electrons. Viewing a global perspective of solar wind, it may be a favorable study with the contribution of non-thermal solar wind electrons.