ABSTRACT

Solar wind plasmas are reported abundantly to enrich with the propagating modes and instabilities sourced by temperature anisotropies associated with different charged species. In situ measurements revealed the bounded magnitudes of these anisotropies at large heliocentric distances. The present thesis details about electron firehose instability as major candidate to regulate parallel electrons temperatures in conjunction with the interplay of solar wind ions and electrons under the dilute space plasmas condition. A velocity-moments based technique is adopted by taking bi-Maxwellian model for both electrons and ions whose temperatures, in addition, may vary in time t. On the basis of macroscopic quasilinear procedure, a closed set of equations are formulated to depict the dynamical picture of wave-spectrum, ions and electrons temperatures along with wave-energy density associated with growth rate of unstable mode. Looking at the contributions of ions and electrons, it may be an important step for understanding the solar wind plasma on global scale