

Evolution of pickup ion density structures in the outer heliosheath

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Two-dimensional hybrid simulations are performed to investigate how the density structure of pickup ion (PUI) evolves in the outer heliosheath (OHS). OHS is considered to be the source region of localized bright emission of energetic neutral atoms (ENAs), known as IBEX Ribbon. The most probable source of these ENAs is PUIs in OHS, origin of which is the charge-neutralized solar wind inside the heliosphere. In the simulation system, we assume hot solar wind and cold interstellar plasmas, which tangentially flow each other at the heliopause. Such environment allows evolution of Kelvin-Helmholtz instability (KHI), resulting in the plasma mixing as well as turbulence development in its nonlinear stage. We analyze the effect of these KHI properties upon the PUI dynamics in OHS. We have identified the growth of filamentary structure in the PUI density when the primary PUI energy density is comparable to those of the background plasma. We will further discuss the dependence of several PUI parameters on the characteristic of PUI dynamics in OHS, which can cause the non-stationarity and non-uniformity of IBEX Ribbon.