

# Pickup ion dynamics in the velocity shear layer across the heliopause

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Consequences of the charge exchange between solar wind plasmas and interstellar neutral particles substantially control the environment of the heliospheric boundary. Recent in-situ observations by Voyager 1/2 and energetic neutral atom (ENA) observations by the Interstellar Boundary Explorer (IBEX) have verified many new features in this region. One of such findings is known as "IBEX ribbon", the bright ENA emissions concentrated in a narrow area. The ribbon geometry is well associated with the local interstellar magnetic field draped on the heliopause, so that the vicinity of the heliopause is its likely source region. The dominant energy range in this ribbon structure (a few keV) indicates that interstellar pickup ions (PUIs) must be the primary source. The purpose of this study is to clarify the physical properties of the ribbon. In this study, we demonstrate hybrid simulations to investigate the dynamics of those PUIs around the heliopause, where the velocity shear might be present between the flow of the solar wind and the interstellar medium. The growth of the Kelvin-Helmholtz instability (KHI) is then expected. We will verify the impact of the presence of PUIs on the KHI properties, the efficiency of the charge exchange, and local concentration of the energetic population and its nonstationarity.

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