

Pickup ion dynamics in the heliospheric boundary region

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Structural properties of the whole heliosphere are regulated by its boundary environment, where the solar wind plasma and the local interstellar medium interact each other. Besides in-situ measurements by Voyager 1 and 2 currently traveling through the heliosheath, the Interstellar Boundary Explorer (IBEX) has provided all-sky maps of energetic neutral atom (ENA) emissions from the boundary of the heliosphere, which enables us to draw the global images of the energy-resolved plasma distribution. The puzzling finding from IBEX mission is a narrow band of bright ENA emissions, called "ribbon". After its finding, numerous models have been proposed to account for the origin. The ribbon geometry is well associated with the local interstellar magnetic field draped on the heliopause, so that the vicinity of the heliopause is the likely source region of the ribbon ENAs. The counterparts of ENAs are interstellar pickup ions (PUIs) embedded in the solar wind. Therefore, the basic properties of PUIs around the heliospheric boundary are the key clue to understand the ribbon generation. In this study, we perform numerical simulations of following the PUI dynamics in the environment of the heliospheric boundary, where the magnetic reconnection or KH instability might take place. Preliminary results regarding the PUI energy distribution will be discussed.