

Hybrid simulations on the evolution of the pickup density structure associated with the fluctuating heliopause

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We have examined the pickup ion (PUI) dynamics influenced by the fluctuating heliopause by means of two-dimensional hybrid simulations. PUIs are provided in the outer heliosheath, where a charge exchange process takes place between the neutral solar wind and interstellar plasmas. The PUI column density integrated in the direction perpendicular to the heliopause implies the profile of energetic neutral atom (ENA) emission detected by IBEX. In this study, we investigated how the Kelvin-Helmholtz instability or magnetic reconnection affect the PUI density structure under various conditions in the vicinity of the heliopause. The characteristics of the resultant column density can associate the profiles from IBEX observations with the physical processes occurring around the heliopause. It is expected that the results will be used as a template for determining the environment of the heliospheric boundary region.