

Structural variations in the pickup ion density associated with magnetic reconnection at the heliopause

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Pickup ions (PUIs) can be the probe for the physical processes occurring around the heliopause in the form of energetic neutral atoms (ENAs) after their charge-exchange with interstellar neutral particles. In this study, we focus on the nonstationarity of the heliopause, where the directional change in the magnetic field is approaching. This situation triggers the magnetic reconnection at the heliopause, resulting in the mixing of particles between the heliosphere and interstellar space. We have performed two-dimensional hybrid simulations to follow the PUI kinetics. It is confirmed that PUI in the outer heliosheath are gathered into the reconnection site accompanied with the coalescence of magnetic islands. We calculate the column density integrated across the heliopause, which will be associated with the ENA observations by IBEX. The properties of its spatial and temporal variations are compared with those from the case of Kelvin-Helmholtz instabilities along the heliopause. It will be useful for the identification of the heliopause environment by extracting these properties from the observational data.