



Understanding the Oxygen Ions Observation in the Tail Plasmasheet: Two Events Study

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Oxygen ions originated from the earth ionosphere are very important players in the earth magnetosphere and understanding the behavior of them is critical in the research of MI coupling processes. Here we report two interesting events observed by Cluster in its tail season. The first one is related to the ToF effect of O⁺ reconnection outflow in magnetotail reconnection region. The second one is about two intermittent O⁺ flux enhancements with a clear energy and pitch angle dependence signature, named butterfly distributions. Protons spectrum also presented the two corresponding flux enhancements but they are weaker and observed later than that of O⁺. Using backward tracing test-particle simulations, we reproduce the main observation signatures. All these results provide a further understanding of oxygen ion dynamics associated with reconnection and DFBS in the tail plasmasheet.