Oxygen torus near the plasmapause observed by Arase

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Using the magnetic field and plasma wave data obtained by the fluxgate magnetometer (MGF) and plasma wave experiment/high-frequency wave receiver and onboard frequency analyzer (PWE/HFA and OFA) instruments on board the Arase satellite, we search for enhancements of O^+ ion density in the deep inner magnetosphere known as “the oxygen torus”. We estimate the local plasma mass density (rho_L) and the local electron number density (n_{eL}) from the resonant frequencies of standing Alfvén waves and the upper hybrid resonance band, respectively. The average ion mass (M) can be calculated by M~rho_L/n_{eL} under the assumption of quasi-neutrality of plasma. Preliminary analysis of some events at dawn, in which toroidal standing Alfvén waves appear clearly during the storm recovery phase, reveals that M is enhanced in the vicinity of the plasmapause, implying formation of the oxygen torus. In presentation, we will show more detailed analysis results and discuss the formation mechanism of the oxygen torus.

