

Akebono Suprathermal ion Mass Spectrometer observations of the cleft ion fountain

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The cleft ion fountain is known to spout out from the dayside cleft and be blown into the polar cap by antisunward convection. The O^+ ions are believed to gravitationally bound back into the ionosphere while lighter H^+ and He^+ ions are successively accelerated by ambipolar electric field and injected into the magnetospheric tail region. The Akebono satellite observes the cleft ion fountain existing in the dayside cleft region, and a clear IMF B_z dependence of the ion drift velocity is found. However, few downflow ions are found in the nightside polar cap region under any conditions on the IMF. This indicates that the O^+ ions as well as H^+ and He^+ are accelerated upward even in the nightside, which suggests the ambipolar electric field larger than proposed before.