Plasmaspheric Euv Image Seen from the Lunar Orbit

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EUV images from the new perspective of lunar orbit have become available. Our KAGUYA-EUV images will mostly be used to study of plasmaspheric dynamics in combination with data from IMAGE-EUV. We have reported the inward motion of the plasmapause in the night side during the disturbed period on 1-2 May 2008. From the meridian view, we have determined that the inward speed is 0.2 Re/hour on the assumption that the plasmapause was featureless and azimuthally smooth on the nightside. This result is consistent with the estimate based on simultaneous measurements of the solar wind velocity.

We have also identified the plasma depletion in the plasmasphere during a phase of decreasing Dst. This might be the "donkey ears" phenomenon which is often identified by in-situ electron density measurements within the plasmasphere. Because the instrument was not operated routinely in May 2008, the observation coverage was imperfect. We believe that the betatron drift theory is able to explain the nature of the plasma depletion observed in the equatorial plane.

While these features, i.e., the inward motion of the plasmapause and plasma depletion near the equatorial plane, have been reported previously, the TEX instrument is novel in that it images the plasmasphere from a remote meridian perspective. It thus has the potential to extend the capabilities of previous observations. The side-view images provide a major advantage in terms of visualising the plasma depletion scenario. Obana [2010] has used this advantage to study the refilling of the plasmasphere.

The instrumental check has now been completed, TEX is being operated, and images from KAGUYA-EUV have been routinely produced and are available to monitor the behaviour of the plasmasphere.