



The asymmetric geospace - the most common state of the system

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Previous studies have shown that conjugate auroral features are significantly displaced in the two hemispheres when the interplanetary magnetic field (IMF) has a transverse (Y) component. Furthermore, it has been shown that a B_y component is induced in the closed magnetosphere due to the asymmetric loading of magnetic flux in the lobes following asymmetric dayside reconnection when IMF has a strong Y component. The magnetic field lines with azimuthally displaced footpoints map into a «banana» cell in one hemisphere and an «orange» cell in the other. This means that both the magnetosphere and the ionosphere are asymmetric during such conditions. As the most common orientation of IMF is to have a dominant B_y component an asymmetric geospace is in fact the most common state of the system.

In this paper we study auroral features observed (IMAGE and Polar) and convection pattern (all available data) during a magnetic storm on August 17, 2001. Due to the combination of a strong IMF B_y component (>20 nT) and tilt angle of 23 degrees we observed conjugate auroral features, which were displaced as much as 4 MLT. Convection data are consistent with this asymmetric state of geospace. We also observed that the asymmetries were reduced by substorms during that period.