Statistical Mapping of X-ray Emissivity in Dayside Magnetosheath and Cusps in Preparation for SMILE

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SMILE is a recently selected ESA & Chinese Academy of Science mission which will study the dayside magnetospheric interaction via soft X-ray images and auroral observations. High-density regions and boundaries such as the magnetopause, cusps and bow shock can be identified from soft X-rays in which their motion and location can be tracked. This provides valuable information on the global state of the magnetosphere such as the amount of closed flux within the dayside magnetosphere and the rate of magnetopause erosion. However, to determine an accurate pointing strategy, and to interpret the global X-ray images, it is vital to determine the spatial distribution of the X-ray emissivity in close vicinity to these regions at this early stage. In-situ plasma measurements such as velocity and density can be used to estimate the level of emissivity. In this poster, we produce statistical maps of the X-ray emissivity for the equatorial dayside magnetosheath and the cusps using THEMIS and Cluster data, respectively. These maps demonstrate that the level of emissivity varies significantly with solar wind flux, and therefore has to be taken into account when accurately identifying key regions and boundaries.