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Using X-ray imaging to find the magnetopause location

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The process of charge exchange between solar wind highly charged heavy ions and exospheric neutrals produces soft X-rays in geospace. The regions with the strongest emissivity are the magnetosheath and cusps. The Soft X-ray Imager (SXI) on board the forthcoming SMILE mission will measure X-ray emissivity integrated along the line-of-sight. By analyzing 2-D maps of X-ray counts from the SXI, we can extract information about magnetopause shape and position. It has been suggested that the maximum of integrated emissivity is tangent to the magnetopause. We check this assumption using the results of MHD simulations for different points along the SMILE trajectory. We show that this method can be used for finding the magnetopause location if some corrections are applied. We present methods of determining the location of the maximum of integrated emissivity using SXI counts maps for a moderately and strongly compressed magnetosphere.