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Earth's magnetopause structure based on the Grad-Shafranov reconstruction solver and THEMIS multi-spacecraft data

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The Earth's magnetopause is a thin current sheet and its two-dimensional structure can be inferred from the so-called Grad-Shafranov (GS) solver along with single spacecraft data (Hau and Sonnerup, 1999). The methods require high quality analysis results of magnetopause normal and deHoffmann-Teller frame for the crossing events. The events are thus need be properly selected. Attempts have been made to apply the GS scheme to the magnetopause crossing events seen by two or more spacecraft (Hasegawa et al., 2004; 2005) as a verification of method. Specifically, the plasma and magnetic field results predicted from the reconstructed maps based on individual spacecraft data can be compared with the observations seen by other spacecraft. In this study we apply the GS technique to the THEMIS magnetopause crossing events. Both types of magnetopause structures - tangential and rotational discontinuities are examined.