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Plasma Depletion Layer Comparisons

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The Plasma Depletion layer (PDL) is the region close to the magnetopause where the magnetosheath density decreases and the magnetosheath magnetic field strength increases. Because of the spacecraft sampling and the orbital coverage, the structure of the PDL has not been entirely determined. Studies have reported PDL with different spatial extends under both northward and southward IMF conditions. This indicates different mechanisms resulting in the formation of the PDL. In this study, we search for the depletion layer examples close to the subsolar and high latitudes of the magnetopause using Themis, Cluster, and Interball spacecraft data. Owing to their orbits, these three spacecraft scan the different parts of the magnetopause and allow us to compare the examples we find. The PDL is identified using plasma beta and the characteristics of the selected PDL examples were grouped and analyzed in order to determine the PDL structure and its dependence on the solar wind and IMF. Based on these examples, the formation mechanisms will be addressed.