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Jupiter's Magnetospheric field: Lessons learnt and modeling

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Galileo has provided a comprehensive dataset of field and plasma measurements in the magnetosphere of Jupiter. These observations have helped us characterize a rotationally driven magnetosphere over a long period and under a range of solar wind conditions. The observations show that the Jovian magnetosphere displays strong temporal and local time variations. Though magnetic reconnection in the magnetotail appears to play a significant role in the dynamics of Jupiter's magnetosphere, it is not yet clear if the reconnection is mediated by the solar wind IMF properties or is driven by internal processes.

This talk will report progress in two inter-related topics. First, I will summarize the observations from field, plasma and wave instruments in the magnetosphere of Jupiter and explore the sources of local time and temporal variations in these observations and compare the observations with recent MHD simulations. Next, I will present progress in building global magnetic field models of this complex magnetosphere.