A08 - Dynamics of Jupiter’s Rotating Magnetodisc and the Generation of Low-Frequency Waves

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Abstract

Unlike the terrestrial magnetosphere, which is primarily driven by the solar wind's convective electric field, Jupiter’s magnetosphere is dominated by planetary rotation. The rapid rotation of its magnetic field forms a magnetodisc, driving numerous dynamic energetic processes and powering polar auroral emissions. It is widely accepted that the angular velocity of the magnetodisc drops significantly between 30 R_J and 50 R_J, creating a subcorotating system in the middle and outer magnetosphere. Consequently, the rotation of the magnetodisc generates various periodic signals within the Jovian system. By analyzing these periodicities using in situ and remote sensing measurements alongside numerical simulations, we propose a comprehensive view of how the rotating Jovian environment generates multi-scale periodicities, and we urge a reconsideration of the rotation speed in the outer magnetosphere.