



Saturn's planetary period oscillations observed during 10 years of Cassini

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Planetary period oscillations (PPOs) with periods close to Saturn's rotational period are ubiquitous throughout Saturn's magnetospheric system. Here we review the observational studies of PPOs determined from magnetospheric magnetic field data throughout the Cassini mission to date. As first shown using radio data, two oscillatory systems are present, one associated with the northern polar region and the other with the southern. We show that within the northern (southern) open-field polar region only the northern (southern) PPO oscillations are detected. However, within the equatorial 'core' region of Saturn's magnetosphere (dipole $L \leq 12$), the two oscillations are superposed and interfere. The PPO periods are shown to lie in the range ~ 10.6 to 10.8 h, are persistently shorter north than south to date, and undergo a strong seasonal cycle together with the oscillation amplitudes. We discuss these observations in relation to theoretical models that have been proposed to explain them, and emphasize the importance of continued measurement of their properties during the Cassini solstice mission.