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Exploration of the magnetodisk of Saturn around equinox

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In 2009 eleven consecutive orbits of the Cassini spacecraft (from Rev 108 to Rev 119, with the exception of Rev 118) were constructed in such a way, that each of them intersected the equatorial plane of Saturn at about 22:00 LT, and approached the equator at decreasing inclination. Along all of these orbits Cassini flew by Titan, starting with T52 (2009-094T01:47:48 on 4 April), and finishing with T62 (2009-285T08:36:25 on 12 October). The equinox of Saturn was in August 2009, therefore this set of orbits is of particular interest for studying the nightside plasmadisk of Saturn.

One of the most striking features of the Kronian magnetosphere is that it displays rotational modulation effects and the periodicity of these effects is determined by the Saturn Kilometric Radiation (SKR) - a radio emission originating from the planet. This (variable) periodicity modulates the plasma environment of the Kronian satellites, and strongly influences the moon-magnetosphere interactions, but its properties and origin are not completely understood yet. The SKR periodicity was observed in magnetic field, as well as in particle data, even in the outer magnetosphere.

In this contribution we analyze plasma features observed along Rev 108 – Rev 119, and we compare the periodicity of the features with a simple structural model (SSM) describing the flapping motion of Saturn's plasma sheet [Arridge et al. 2011]. We also investigate deviations from the simple model.

Arridge, C. S., et al. (2011), Periodic motion of Saturn's nightside plasma sheet, J. Geophys. Res., 116, A11205,
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