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Saturn's spin modulation of SKR kilometric radiation

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Long time series analysis of SKR measurements by Cassini/RPWS (taken over one year or the duration of about 800 planetary rotations) exhibits a well defined fundamental periodicity at 0.44967 day (10.792 hr). Periodogram calculations (e.g. by Fourier transforming and comparing several, shorter time intervals) show that the period was constant over the whole studied interval (Nov. 2004 to Nov. 2005). The period is different and about 1% longer than the SLS period (0.44401 day) determined from Voyager observations, 25 year ago (Desch and Kaiser, GRL, 1981), and is consistent with determinations from 1994-2003 Ulysses observations (Galopeau and Lecacheux, JGR, 2000). Furthermore, by using the orbital motion of Cassini (18 orbits), one can show that the phase of the SKR periodic modulation does not follow observer's motion and is rather constant. While dismissing any "searchlight" effect for explaining the SKR modulation, this fact does not necessary imply, as thought at Voyager time, that the radio source has a fixed position in local time. We propose an alternative model, more in agreement with Cassini (UV and radio) new observations and try to answer the following questions: did the SKR radio period really vary since the Voyager epoch? What is the relationship between radio period and planetary spin rate ? What is the actual sidereal rotation period of Saturn ?