



Elliptical polarization of Saturn Kilometric Radiation (SKR) observed by Cassini/RPWS

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The high-inclination orbits of the Cassini spacecraft from autumn 2006 until spring 2007 allowed the Cassini/RPWS (Radio and Plasma Wave Science) instrument to observe Saturn Kilometric Radiation (SKR) from latitudes up to 60° for the first time. This has revealed a surprising new property of SKR: Above 30° in observational latitude a significant amount of SKR is strongly elliptically polarized, in marked contrast to previous observations from low latitudes which showed only circular polarization. There are transitional latitudes where the elliptical polarization occurs in "patches" in the time-frequency spectrograms next to regions of still completely circularly polarized SKR. From 45° - 60° in latitude it is found that almost all of SKR (especially from the northern hemisphere and less from the southern hemisphere) is elliptically polarized throughout its entire frequency range with an average degree of 0.7 in linear polarization. We demonstrate the ellipticity of SKR by using the concept of "apparent polarization" in case of 2-antenna measurements, but also show 3-antenna measurements from which the polarization can be unambiguously determined.