



Relationship between Saturn Kilometric Radiation emissions and kronian magnetotail activity, as compared with the terrestrial case

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Previously for the case of the Earth's magnetosphere, it has been found that the sub-storm phenomenon is identified with a component of the probability distribution of durations for which the AU or AL indices are above or below a fixed threshold, respectively [Freeman, Watkins and Riley, 2000]. The AU and AL indices measure magnetic perturbations associated with the eastward and westward auroral electrojet currents, respectively, and thus are linked with Auroral Kilometric Radiation (AKR) emissions. After exploring the correlation between substorm activity in the terrestrial magnetosphere and measurements of AKR, we then apply the threshold crossing technique to Saturn by using data from the Cassini Radio and Plasma Wave Science (RPWS) instrument. Several examples of reconnection in the magnetotail of Saturn have been discovered using data from the Cassini magnetometer [Jackman *et al.*, 2007]. These and other events have subsequently been found to be roughly associated with bursts of Saturn Kilometric Radiation (SKR) emission. We explore this link in detail, looking at the probability distributions of the SKR powers above and below fixed thresholds with a view to revealing kronian substorms as a distinct separate population with a characteristic scale.

References:

Freeman, Watkins and Riley, Evidence for a solar wind origin of the power law burst lifetime distribution of the AE indices, *Geophys. Res. Lett.*, 27, 8, 1087-1090, 2000

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