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Saturn's ring current observed during Cassini's Grand Finale

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The presence of a substantial azimuthal current sheet in Saturn's magnetosphere was identified in Voyager and Pioneer magnetometer data. Data from these spacecraft showed depressions in the strength of the field below that expected for the internal field of the planet alone. This ring current was modelled as a simple axisymmetric current system by Connerney et al. [1980, 1983]. In this study we utilise the Connerney ring current model to look at the size, shape, current density and total current of Saturn's ring current as observed during the Cassini proximal orbits. We compare the variations in these parameters with the phases of the planetary period oscillations and with the occurrence of magnetospheric storms as determined from propagated solar wind data and LEMMS electron and proton data. Overall, we find that Saturn's ring current is a dynamical environment which varies in size and magnitude due to both planetary period oscillations and solar-driven storms.