

Magnetic polarisation and phase structure of Saturn's 10.7 hour oscillations

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Abstract

A source of Saturn's magnetic 10.7 h period oscillations has yet to be identified. The signals are known to consist of signals with slightly different periods with separate northern and southern sources. However we show in addition that although the signals are highly periodic they are usually not sinusoidal. Moreover, we show differences in both phase structure and polarisation in the outer magnetosphere (where field lines map to the tail) with respect to what is seen in the inner dipolar region. Paying particular attention to the deep mid-tail passes of 2006, the contrast between behaviour in the inner and outer regions is clear with more or less sinusoidal behaviour in the dipolar region and a pulse like signal in the tail. The latter seems to indicate that magnetic stress is released impulsively once per cycle in the tail.