

Saturnian Tidal Dissipation from Astrometric Observations

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Abstract

Orbital satellite evolution is crucially linked to tidal dissipation inside the primary. Recently, tidal dissipation inside Jupiter has been derived successfully from the monitoring of the Galilean satellite motions, thanks to accurate astrometric observations dispatched over a wide time span. Here, we present a similar study but focused on Saturnian satellites. Since significant exchange of angular momentum between the Saturn rings and the satellites occurs because of resonances (with special emphasize on Mimas), we have developed a specific procedure that separates in the fitting process the dynamical effect coming from Saturnian dissipation with the one coming from the rings. Our results suggest a high dissipation in Saturn that would result in a significant heating of the interior of some of Saturn's mid-sized satellites.

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