



The vertical structure of the Daphnis wakes at the Keeler gap edge

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Abstract

Saturn approached its equinox in August 2009 when the Sun has casted long shadows onto the ring-plane where vertical perturbations alter the otherwise thin, smooth disk. One example are the shadows at the Keeler gap edge caused by Daphnis' gravitational perturbations. An inclination of its orbit has been proposed to be reason for these more than 1 km extended ring-deviations [1].

Here we show recent results of N-body simulations of the vertical structure of the Keeler gap edges. We found that particle collisions can alter significantly the vertical structures causing a drastic increase of the vertical velocity dispersion (scale height) of the ring near the edges also if the moon is not on an inclined orbit. In case of the Keeler gap edges this may lead to vertical excursions of the ring particles larger than 1 km. We will compare and discuss the importance of both processes (moon inclination and particle collisions) for the vertical structure of the Keeler gap edges.

References

- [1] Weiss, J. W. and Porco, C. C. and Tiscareno, M. S.: Ring Edge Waves and the Masses of Nearby Satellites, *Astronomical Journal*, Vol. 138, pp. 272-286, 2009.