

Observations and theoretical analysis of the rotational dynamics of Hyperion

A.V.Devyatkin, D.L.Gorshanov, A.N.Gritsuk, A.V.Melnikov, I.I.Shevchenko

*Pulkovo Observatory, Russian Academy of Sciences,
Pulkovskoje ave. 65/1, St.Petersburg 196140, Russia. E-mail: adev@gao.spb.ru*

Series of astrometric and photometric observations of Saturn's satellite Hyperion are performed on the ZA-320 mirror astrograph with a CCD array. The time period of observations covers 1998 and 1999. On the basis of these observations, astrometric positions of the satellite are found, and lightcurves are constructed.

Main software components intended for studies of the rotational dynamics of non-spherical natural satellites by means of analysis of their lightcurves are developed. Modeling the lightcurves allows one to estimate the parameters of dynamical asymmetry of satellites and to determine their orientation in space. A preliminary modeling of the observed lightcurve of Hyperion is performed. Already this preliminary modeling confirms that Hyperion cannot reside in the regime of planar synchronous rotation inherent to many natural planetary satellites.