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# Activity of comet 45P/Honda-Mrkos-Pajdušáková and the non-gravitational acceleration model

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## Abstract

Comet 45P/Honda-Mrkos-Pajdušáková is among the Jupiter Family Comet distinquished with very eccentric orbit (e = 0.83) and the small perihelion distance (q = 0.53 AU). With a geocentric distance of only 0.06 AU in 15 August 2011, the comet will be outstanding observational target (e.g. one of the objects preliminary planned to observe with Herschel Space Observatory). Anisotropic model of outgassing for 45P/Honda-Mrkos-Pajdušáková is analyzed based on the behavior of the light curves from the previous apparitions of the comet as well as on the variability of the nongravitational forces acting on the cometary nucleus. The non-gravitational perturbations in the orbital motion are investigated using the spotty model for outgassing (Szutowicz et al., 2008). In the process of orbit improvement the spin axis orientation, the location and size of active region are found from numerical fitting of the non-gravitational acceleration model to positional observations of the comet. The orbital linkages of the last apparitions of the comet result in the spin axis orientation given by the equatorial obliquity $I \sim 95^o$ and the solar longitude at perihelion $\Phi \sim 315^o$, and location of the active region is found close to the cometary equator ($\beta \sim -5^o$). Orbital calculations indicate possible time variations of the spin axis of the comet and the size change of the active area during the last five revolutions. The non-gravitational perturbations are also used to constrain the mass and bulk density of the comet nucleus. The short-time variations in the anisotropic emission and some inconsistency of the nongravitational perturbations and the observed activity profile are discussed.

## References

[1] Szutowicz, S.et al.(2008) A&A 490, 393-402