SPATIAL SEPARATION OF ASTEROIDS WITH DIFFERENT ALBEDOS. A. M. Kazantsev, Astronomical Observatory of Kyiv Taras Shevchenko National University, Observatorna st. 3, Kyiv-53, 04053, ankaz@observ.univ.kiev.ua

Numerical calculations: Numerical calculations of orbit evolutions of 1694 numbered asteroids included in the IRAS catalogue, from November 13, 1996 to March 6, 2006 were carried out. The values *da* – differences between the catalogue semimajor axes at March 6, 2006 and the calculated ones were computed. Dependences of asteroid albedo *p* upon *da* were constructed. The average dependence *da(p)* shows decrease of *da* at increase of *p*, and it is statistically significant (Fig.1). Values *da* are shown in 10^{-6} AU. The IRAS catalogue [1] which contains the sizes and albedos of 2228 asteroids was used.

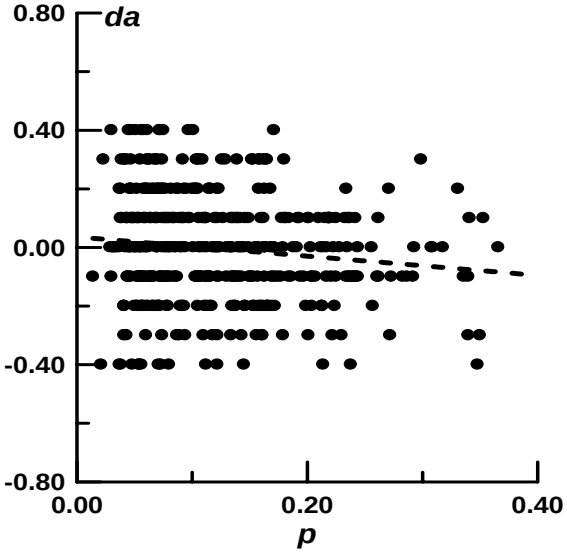

Fig.1. Dependence *da* on asteroid albedos

In other words, semimajor axes of low-albedo asteroids are, on average, increasing as compared with high-albedo ones. To explain this fact it may to suppose an existence possibility of a non-gravitational effect. Speed of such possible spatial separation for the most dim asteroids (p = 0.03) and for bright ones (p = 0.40), and with sizes 10 - 50km in order of magnitude is about 1 AU per 10^8 years.

Observational confirmation: Among asteroids, relating to the families there were selected the bodies included in the IRAS catalogue. The were obtained 8 families having more than 10 asteroids included in the IRAS catalogue. To each of these families the dependences albedo on semimajor axes were constructed. These dependences confirmed the supposition on the existence possibility of non-gravitational effect, above all, the dependence for Flora family (Fig.2).

The analysis of residuals in the asteroid orbit catalogues on 1996 and on 2006 was carried out. It is obtained, that for orbits with the larger residuals the dependences *da(p)* are appeared more clear and significant, than correspondent dependences for orbits with the less residuals. This result can be viewed, as indirect confirmation of existence possibility of the mentioned non-gravitational effect.

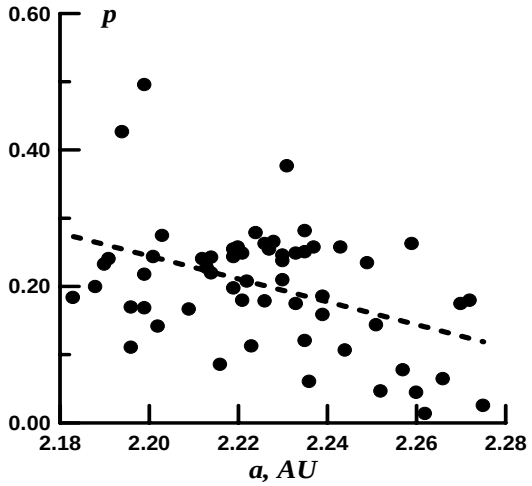

Fig.2. Distribution albedo – semimajor axis for Flora family asteroids

The NEAs quantity, coursed by action of possible non-gravitational effect was calculated. The supposition on the effect doesn't contradict to the NEAs quantity.

References: [1] Tedesco Edward F et al. (2002) *The Astronomical Journal 123*, 1056-1085.