

Analysis of a large sample of Kuiper Belt objects' lightcurves

J.L. Ortiz, R. Duffard, P. Santos Sanz, A. Thirouin, N. Morales and F. Aceituno

(1) Instituto de Astrofísica de Andalucía – CSIC. Granada, Spain (ortiz@iaa.es)

Abstract

From photometric observations of KBOs one can retrieve plenty of information on these important objects: absolute magnitude (and thus a crude size estimate), colour properties, phase curves (which give constraints on surface properties) and lightcurves (which provide information on shape, spin and internal structure). In this work, lightcurve parameters of a sample of 75 objects are analyzed, mainly from data by our group (29 of them), by means of a special program which was specially designed to avoid a bias against low amplitude lightcurves, but also from data in the literature. For the rotation periods the mean value obtained by a Maxwellian fit in rotational frequencies is 7.3 hours. This result is taking into account the criteria of considering a single peaked light curve for objects with amplitudes lower than 0.15 mag, whose variability is attributed to surface markings and double peaked lightcurve for those with larger amplitudes, whose variability is thought to arise from their more elongated aspherical shape. Thanks to this sample of lightcurves, we have analyzed possible correlations between some physical and orbital parameters. Our study suggests several possible correlations within physical and dynamical parameters. In addition, a simple shape model has been used to compare rotational periods and amplitudes of lightcurves with the observations. Some results from this model are presented.