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Asteroids families: size distributions of the families' members and relative ages of the families

J. Leliwa-Kopystynski (1,2), I. Wlodarczyk (3)

(1) University of Warsaw, Institute of Geophysics, (2) Space Research Center of PAS, (3) Chorzow Planetarium (jkopyst@mimuw.edu.pl / fax +48-22 5546882)

Statistical method of identification of the asteroid families is proposed and applied for the 130037 numbered asteroids. Each family is centered (in the proper elements space a, e, i) on its largest member. Comparison of “degree of dispersion” of family members in different families allows ordering families according to their age. The diameters D (in kilometers) of the family members are calculated by means of the formula D = 1329 x 10ˆ(-H/5) Aˆ(-1/2). Here H is the absolute magnitude and A is the albedo. It was found that the most numerous families count as many as a few thousand members. About 30% of the asteroids supposed to be the family members have diameters larger than 5 km. So, these datasets contain a few hundreds of asteroids. They are large enough to study the size distributions. Power law distributions N(D) and cumulative distributions N(>D) are fitted. These distributions are compared with distribution of impact-originated fragments of disrupted targets in the laboratories.