EPSC Abstracts,
Vol. 2, EPSC2007-A-00026, 2007
European Planetary Science Congress 2007

Identification of dynamic parameters for fireballs

M. Gritsevich (1)

(1) Institute of Mechanics, Moscow Lomonosov State University, Moscow, Russia
(gritsevich@list.ru / Fax: 7 495-9390165 / Phone: 7 495-9393120)

Now a big actual material on photographic registration of meteoric bodies trajectories in the Earth's atmosphere is accumulated. The greatest number of pictures is made by the four fireball networks which functioned at various times in the USA, Canada, the Europe and Spain. Approximation of real data by theoretical dependencies allows to receive the additional estimations which are not following directly from observations. Here the algorithm of selection of parameters, at which the theoretical dependence of height on speed in the best way approximates data of observations, is offered. The basic difference from previous works is approach of the set points by the analytical solution of the meteoric physics equations. The method was applied to some bright meteors from the Canadian network, Prairie network, and also to the Beneshov bolide, one of the largest, registered by the European network. Correct mathematical modeling of the meteoric phenomena in an atmosphere is necessary for the subsequent estimation of key parameters: extra-atmospheric mass, ablation coefficient, effective enthalpy of evaporation. In turn, these data are important for some applications: researches of asteroid-comet hazard, measures of planetary defense, and also for search of the bodies, capable to reach the Earth's surface.