# Destruction and ablation of meteoroids in atmosphere of planets

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An asymptotic model for the description of meteoroid trajectory in the atmosphere is developed. The model is applicable at large values of mass loss parameter. According to this model there are rates of motion, when whole ablation of a body is completed prior to the beginning its deceleration. The given model is applied to two actual bolides which were observed by stations of Czech part of the European Network in 1997. One of bolide moved with a constant speed along light segment of its trajectory. The asymptotic model has given values of ablation coefficients. This coefficient for second braking bolide is in a good agreement with value determined on its deceleration. The application of the asymptotic model to large meteoroids has given the formulation of the new concept the 1908 Tunguska fall. According to these representations, the evaporation of fragments of desroyed meteoroid has taken place in atmosphere at speed of motion, practically equal to speed of entry. The last phase of the Tunguska phenomenon the fall on the Earth of a shock wave and the gas driven after it explains the forest fall and burning of trees and the absence of an impact crater. Analytical models for destruction of meteoroid in atmosphere and consequent motion and ablation of a debris cloud are developed. A sequential dsintegration describes motion of bodies of the mean sizes. The fragmentation of large meteoroids occurs according to model of instantaneous destruction.

The motion and ablation of a debris cloud are described with the help of classical equations of meteoric physics with a variable area of cross-section. The variability of this area reflects speed of accumulation of fragments in the cloud and its interaction with atmosphere. In all cases a trajectory of a desroyed body was calculated by means of the simple analytical formulas. A comparison with the numerical solutions shows the satisfactory consent. The analytical solutions are used for the solution of an inverse problem of meteoric physics, i.e. for determination of meteoric bodies parameters based on observational data of a light segment of its trajectory.