Abstract

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Solar system is fascinating dynamical system, however for people the near-Earth region is probably the most important. Interplanetary material in the form of interplanetary dust, meteoroids and even larger objects is transported to the Earth from different parts of Solar system. Original orbits of these bodies are significantly affected by gravitational perturbations and non-gravitational effects. In this thesis we investigate dynamical routes of meteoroids from various source regions in the Solar system and their inflow to the neighbourhood of the Earth. We use numerical N-body simulations to study motion of objects within the Solar system. Firstly, we examine potential parent bodies of the meteor shower JEO (June Epsilon Ophiuchids), for which the unexpected increased activity was registered in 2019. We will show that the most consistent link to JEO shower can be found in comet 300P/Catalina. Furthermore, we focus on near-Earth asteroids Bennu and Ryugu, which were also classified as potentially hazardous. We investigate potential meteoroid streams originated from these asteroids and their ability to reach the Earth. Finally, we study the 8:3 mean motion resonance with Jupiter as a potential source of meteoroids transported close to the orbit of the Earth. We are interested mainly in meteoroids originated from asteroid Ceres.

Key words: meteoroids, orbital evolution, near-Earth region, resonance, chaos detection