

REVIEW OF THE PhD THESIS

” Thermal Effects in Physics and Dynamics of Small Bodies of the Solar System”

by

David Čapek

The thesis contains a large body of results which have been obtained and published by the candidate and his supervisor over the years, in the framework of the long term project of study of the non gravitational effects in the motion of the small solar system bodies. It collects in one place all the important phases of their work, and presents in a logical sequence gradual development, upgrades and improvements of the physical and dynamical models and methods used in their research.

The thesis indeed presents a lot of innovative ideas and results that are of utmost importance for the dynamics and physics of the small bodies, in particular of the asteroids. These results offer answers to a number of opened questions and explain some puzzling features of the asteroid dynamics, of their distribution in the phase space of orbital elements, and of the dynamical evolution of individual bodies, their groups and populations. Moreover, the dependence of the non gravitational force and torque on some basic physical properties of the asteroids, like their shapes, obliquities, and the thermal properties of their surfaces, are studied in detail and some important clues for the long term evolution of asteroid spins and of orbital semi major axes are revealed.

The form of the thesis is satisfactory, the text is for the most part reasonably well written, and the basic ideas and results are sound and clear. Still the text suffers from a numerous minor errors, inconsistencies, misprints and technical drawbacks (see below for specific remarks). Even if it is obvious that the candidate put a lot of effort to present the thesis in correct English, the language is not always up to the standard and there is a plenty of room for the improvement.

The written declaration by the candidate's supervisor Dr David Vokrouhlický: "Participation of David Čapek on coauthored papers" provides the necessary insight and clear indication on the candidate's significant personal contribution to the presented results, reveals the importance of his participation in the common research and separates it from the work of the others, in particular from that of the supervisor himself. The document gives precise list of the specific contributions, which prove that candidate possesses a detailed knowledge of the field, and witness of his personal competence, expertise and the ability for creative scientific work.

In conclusion, in my opinion the thesis is very good, in that it contains more than enough innovative and important ideas and results. I am thus honored to propose a PhD degree to be granted to the candidate after a successful defense.

Belgrade, October 10, 2007

