



Development of user interface and of the data base "Earth, Moon and Planets" in the VBA environment for teaching students in the Kazan state universities

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In the frame of bachelor and master's degree diploma work the students accumulate and do structure distribution of necessary information about the spin-orbital, dynamical and geophysical characteristics of a planet. The information about the every planet is written into Excel WorkBook, the spreadsheets of which are the data base. The names of sheets reflect their content: "General Data", "Dynamics", "Geophysics", "Engineering", "References", "Slides" etc. These data are taken from the last scientific articles dedicated to the modern problems of the planetary investigations. Especial interest is connected to the Lunar sciences - last data about surface mineral distribution, crust thickness and gravity field, slides with photographies received by Video Camera and various instruments situated on the board of Lunar SELENE mission (Japan, 2007-2009 yrs).

The work with the data base is executed, using elements of the object-oriented programming. The students study to include into the UserForms standard means of Windows - Dialog Windows, TextBox, CommandButton, ComboBox, ScrollBar etc., and to support these elements by the macros written in programming language VBA.

The main attention in the software support of the data base is done onto opportunity to investigate the two-three layer structure of a planet via modeling of its free nutation periods - Chandler-like Wobbles, Free Core Nutation, Inner Core Wobbles and Free Inner Core Nitation and their engineering estimation for space mission observations. The results are presented in the form of tables in Sheets and of diagrams constructed by special buttons of the UserForms on the basis of the calculated tables.

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