

Analysis of lunar macromodels using “Clementine”, “Kaguya”, and “LRO” space missions data

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Abstract

© 2018, American Institute of Aeronautics and Astronautics Inc, AIAA. All rights reserved. The aim of this work is to construct and analyze 3 models of the Moon’s macrofigure using the space missions data and ground observations. At the present time, the task of building a selenocentric dynamical model of the lunar macrofigure (whose origin coincides with the lunar center of mass and axes coincide with the ones of inertia) does not have final solution yet. In this work, the data from “Clementine”, “Kaguya”, and “LRO” space missions as well as large-scale astroplates of the Moon with stars were used. 3 models were constructed using the multiparametric harmonic analysis and expansion in spherical functions. Based on the study of the isohypses built at longitudes $\lambda = 400; 200; 00; -200; -400$ we may conclude that: 1. The mean level of the lunar surface in the South is higher than the one of the Northern hemisphere. 2. The shape of hypsometric curves of “Clementine” space mission’s isohypses are similar to the ones taken from “DSC” catalogue; “Kaguya”, “LRO” isohypses’ variations are significantly different from them.

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