

引用本文(Citation):

李斐,柯宝贵,王文睿,鄢建国.利用重力地形导纳估计月亮厚度.地球物理学报,2009,52(8):2001-2007,doi:10.3969/j.issn.0001-5733.2009.08.007

LI Fei;KE Bao-Gui;WANG Wen-Rui;YAN Jian-Guo.Estimation of the ancient lunar crust thickness from the admittance.Chinese J.Geophys.(in Chinese),2009,52(8):2001-2007,doi:10.3969/j.issn.0001-5733.2009.08.007

## 利用重力地形导纳估计月亮厚度

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Estimation of the ancient lunar crust thickness from the admittance

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摘要

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摘要 在频域使用多窗口(Multitaper)方法来计算月球正面四个形成于不同历史时期月海区(Smythii, Crisium, Imbrium, Orientale)的重力地形导纳,然后将其与月球弹性岩石圈的理论导纳模型相比较,由最小二乘法得出四个月海区的月球岩石圈的平均弹性厚度约为8 km,月亮的厚度分别为:Smythii 盆地,72 km; Crisium 盆地 70 km; Orientale 盆地 60 km; Imbrium 盆地57 km.随着月球的演化,月亮厚度呈现变厚的趋势.

关键词 月球演化, 弹性厚度, 导纳, 重力, 地形

Abstract: The admittance signatures(the ratio of the gravity and topography data in spectral domain)for the four lunar mare basins (Smythii, Crisium, Imbrium, Orientale), which of them have different age, is calculated by a Multitaper method, then compare this observed admittance with the theoretical values from the elastic lithospherical flexure model. On the basis of this method, we obtain the elastic thickness for the four mare basins. The elastic thickness of them are averaged about 8 km to support the observed topography since the time of the loading. The crust thickness increase when the evolution wheel of the moon went ahead. The crust thickness increase from 72 km(Smythii basin) to 70 km(Crisium basin) to 60 km (Orientale basin) to 57 km (Imbrium basin).These results are consistent with thermal history of this planets.

Keywords Lunar evolution, Elastic thickness, Admittance, Gravity, Topography

Received 2008-11-20;

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