

Constraints on Origin of Large-scale Lunar Topographies from Observed Admittance: Viscous Relaxation with Lunar Thermal History

Katsuyuki Ojima [1], Yutaka Abe [2]

[1] Earth and Planetary Phys, Univ of Tokyo, [2] Earth Planetary Phys., Univ. Tokyo

Several mechanisms have been proposed for the cause of the large-scale lunar topographies. In this work, we try to constrain these formation mechanisms from the observed lunar admittance. For simplicity, we express the gravity anomaly by the superposition of the contribution from surface and Moho undulations. We calculated the viscous relaxation of these two undulations for various horizontal scales and formation ages, assuming approximating the moon by a two-layered (crust and mantle) viscoelastic sphere cooled from the surface. Our results indicate that large impact and lamination + dynamic support are consistent with observations for the origin of the large-scale lunar topographies.