

Gravity Results From Lunar Prospector

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Lunar Prospector (LP) entered lunar orbit on January 11, 1998 and was initially placed into a 12 hour eccentric orbit. After two additional orbit insertion burns over the next two days, the spacecraft was placed into a nearly circular orbit with a 100 km altitude. Since January 13th, LP has been continuously returning excellent gravity data in the form of S-band Doppler and ranging observations to the Deep-Space-Network 26 and 34 meter antennas. The Doppler data quality is well below 1.0 mm/s. Many polar features have become clearly evident in the data (Mare Humboldtianum, Schrodinger, Bailly, Clavius,...). I will present the latest spherical harmonic gravity solution to degree and order 75 which incorporates the historical data (Lunar Orbiter, Apollo, and Clementine) together with the new LP data. The improvement in the gravity field, both nearside and farside, will be discussed. Global maps of lunar crustal thickness variations will also be presented and discussed.

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