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The Contributions of ILRS Laser Ranging to the Lunar Reconnaissance Orbiter Mission

Laser Ranging (LR) to the Lunar Reconnaissance Orbit (LRO) was active from June 2009 to September 2014 using a one-way (uplink only) technique where the ground stations fired their lasers at LRO and recorded the fire times, and the spacecraft altimeter, the Lunar Orbiter Laser Altimeter (LOLA), measured the receive events, telemetering them down in the S-band data stream. Ten ILRS stations participated in this ranging, generating over 4000 hours of successful LR data. LR data was used to calibrate the spacecraft clock and to improve the orbital accuracy in the radial direction over just S-Band data alone. In addition the data was used to demonstrate that LR data alone can provide good orbital solutions when used with high-resolution gravity models. This poster will present how the LR data was used and its importance to LRO/LOLA, as well as discuss the on-going passive LR to LOLA experiment.