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**Geopositioning and precision validation of landing locations on the Moon using LRO NAC images and LRRRs**

High-resolution images of the Lunar Reconnaissance Orbiter Camera (LROC) Narrow Angle Camera (NAC), which revealed the landing locations of recent and historic spacecraft on Moon, are used for deriving Mean Earth/Polar Axes (ME) coordinates of these sites. Coordinates of the Lunar Ranging Retro Reflectors (LRRRs) with their most accurate position information of ±27 cm (relativ to the Principal Axis (PA) frame), are used to verify the measured positions. We focus on the landing sites, where retroreflectors are available, namely Apollo 11, 14, 15, Lunokhod 1, and 2. In this work, we use images acquired between 2009 and 2014, and the improved LRO ephemeris and camera orientation models provided by the LRO project (all data typically given in the format of NAIF SPICE kernels) to calculate coordinates for various surface features near the landing sites. First, we pinpoint prominent features by manual inspection, then by high-precision multi image matching (generally X to X images). For each image, the features' ME-coordinates are derived using the geometry models and topographic information. Finally, average ME-coordinates are calculated. The five LRRRs with available high-precision absolute locations are used to evaluate the positioning precisions. The results show that, when using a single LROC NAC image to derive surface coordinates, the positional accuracy is about 20 m , while random errors and accuracy are improved by using multiple images. Finally, an empirical analysis of the geopositioning precision of multi-image triangulation at the Chang'e-3 landing site will be presented.