

# Precise and Accurate Mapping with the Lunar Reconnaissance Orbiter Wide Angle Camera

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## **ABSTRACT:**

The Lunar Reconnaissance Orbiter Camera (LROC) Wide Angle Camera (WAC) is a push-frame camera capable of providing images in seven different spectral bands: 321, 360, 415, 566, 604, 643, and 689 nm. From an altitude of 50 km, the camera is able to capture images with a ground sampling distance of 75 m for the five visible bands and 384 m for both UV bands. Using results from the on-orbit calibration, improved ephemeris from the Lunar Orbiter Laser Altimeter (LOLA)/Gravity Recovery And Interior Laboratory (GRAIL) team, and high resolution Digital Terrain Models (DTMs) we can produce WAC map products with sub-pixel accuracy. Using this capability, the LROC team produced a series of global and regional mosaic products, including the WAC global mosaic, the nearside “no-slew” mosaic, and the farside low sun mosaic. In addition, the LROC team produced a series of WAC products derived from years of observations, including the polar illumination maps and a 400 m/pixel empirically normalized seven color reflectance map that encompassed an average of 142 measurements for each pixel. Each of these products requires precise and accurate mapping of individual WAC images in order to create seamless products and enable detailed mapping of the lunar surface.