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NEW DEVELOPMENTS IN COUNTING VERY SMALL CRATERS

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In lunar planetary science, spatial frequency diagrams of crater diameter counts are used to relatively date solar system body surfaces, but the utility of current generation of high-resolution images received from the current generation of exploratory satellites is limited by inability of Crater Detection Algorithms (CDA) to accurately count craters (33%-88%). Development of improved accuracy CDA software can be aided with sets of Lunar Reconnaissance Orbiter Narrow Angle Camera (NAC) images taken under high, mid and low solar illumination. As the first in a series of articles, the author's literature survey examines barriers to locating overlapping variable illuminated images of lunar surface areas among the 503,206 LRO images published by the LROC Team through Release No. 7 in Sept. 2011. There may be only a few hundred images that meet those illumination criteria. Future research will compile sets of matched images against which newly developed CDAs can be tested, will search for one-meter fresh impacts on the Moon that have occurred since the mid-1960s, and will seek to improve estimates of real-time rate of small lunar impacts. Small meteor impacts will be a hazard to future lunar robotic facilities. Fisher, K.A. (2012). New Developments in Counting Very Small Craters. Selenology Today. 26:1-24, http://digilander.libero.it/glrgroup/.

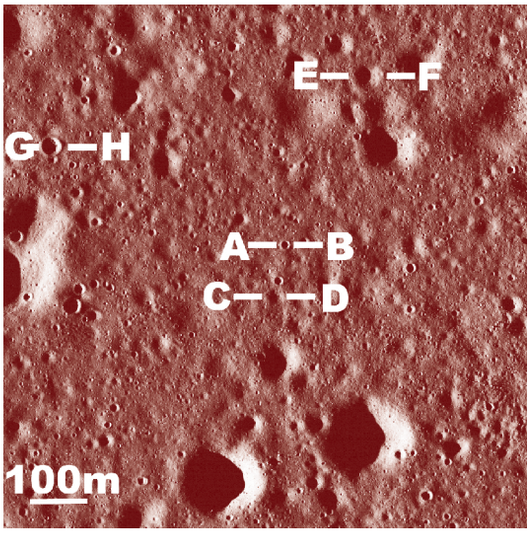

Figure 1: Under 6.17∞ solar illuminated image excerpted from an NAC M147454678LC near lunar coordinations N34.67, W72.53. Credit: NASA/GSFC/Arizona State University.

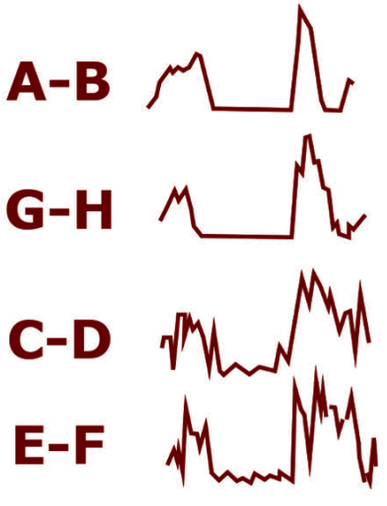

Figure 2: Shape-from-shading profiles of the craters maked in Figure 1 indicate the freshness of an impact. Credit: K. Fisher.