period. Target-mode measurements along each orbit will be based upon science targets defined either prior to the mission or from rapid analysis of the initial M^3 global-mode measurements collected in the first optical period.

Priority high-resolution data: A major effort by the M^3 science team in preparation for orbital operations has been the continuing definition and organization of prioritized global science regions along each degree of longitude. The science team has been using the Rapid Environmental Assessment Composition Tools (REACT) software created by Applied Coherent Technologies (ACT) to define science targets.

Prioritization: The science team has primarily used geologic context along with the Standard Color Composite from Clementine UVVIS data, the Clementine 750nm albedo mosaic, and Lunar Prospector elemental data to define the spatial extent of regions for high-resolution targets. Targets are assigned a priority value of one through three. Priority one targets are expected be measured at the earliest possible opportunity and are defined as those targets that have high spectral contrast and probable high science return, are necessary for calibration or public outreach, or are part of the Lunar International Science Co-ordination/Calibration Targets (L-ISCT) [3].

For example, the central peaks of craters previously identified as containing distinct mineral spectral signatures [4] are all defined as priority one targets as these regions will have high spectral contrast and a high science return. Additionally we have defined the polar regions as priority one targets. These targets extend poleward of 80º and will be measured at every opportunity. Illustrated in Figure 2 is possible coverage of the polar regions during the first optical period.

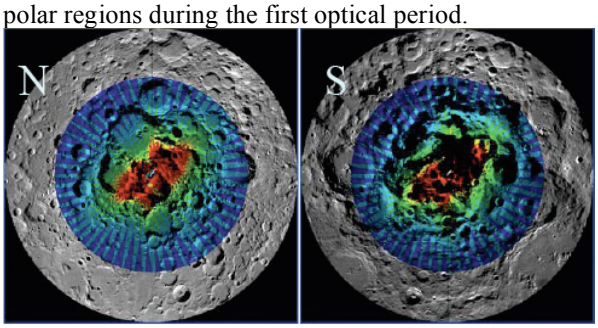

Figure 2. Predicted targeted-mode coverage of the polar regions during the first optical period. The colored areas cover the surface poleward of 80º. Blue indicates that the surface will be measured once while red indicates 4 or more measurements.

Targets assigned a priority of two or three will be measured at any time when downlink is available or when there are no other priority one targets to be measured along a given orbit. These targets typically cover larger regions and require multiple orbits or cover scientifically interesting areas with more mature surfaces (low spectral contrast). For example, Figure 3 shows two targets encompassing Giordano Bruno. The smaller target, covering just the crater, is a priority one target and is ~20 km in diameter. This smaller target is approximately half the 40 km field of view of the M^3 instrument and can be measured in a single, well-placed, orbital pass. The larger target is a priority three target that requires multiple passes to cover the entire region.

Large regions, such as the entire South Pole-Aitken Basin, have been defined as a priority three target so that as downlink is available data will be gradually collected over these important regions. These large areas are clearly visible in Figure 4, which illustrates the locations of all current targets. Priority one targets embedded in larger regions will normally be measured only once. However, exceptions occur for a few areas that are specially designated for calibration and instrument testing purposes. With this targeting approach, it is expected that M^3 high-resolution data will be acquired for 25% to 50% of each lunar longitude, accumulated over the four optical periods of nominal Chandrayaan-1 operations.

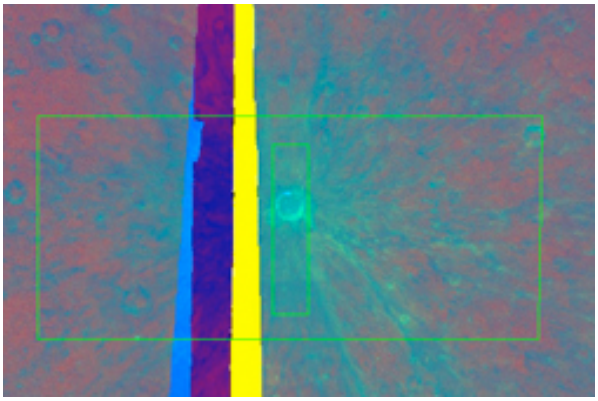

Figure 3. Target coverage over Giordano Bruno as seen with the Standard Color Composite using Clementine UVVIS data. The small target centered on the crater is priority one and ~20 km across while the larger ~400 km target is priority three, requiring multiple orbits.

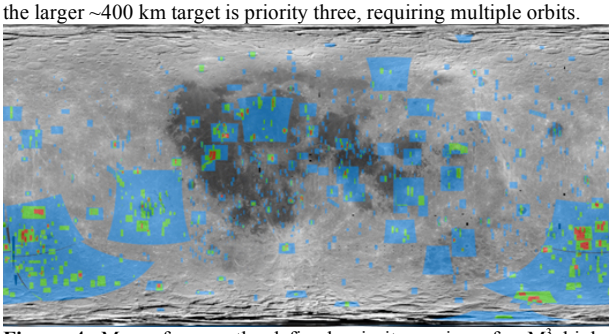

Figure 4. Map of presently defined priority regions for M^3 high-resolution data. Projection is the same as in Figure 1. Small regions embedded in lower priority targets appear as green or red.

References: [1] Pieters, C.M., et al. (2007) *LPSC XXXVIII* #1295. [2] Green, R.O., et al. (2007) *LPSC XXXVIII* #2354 [3] Pieters, C.M. et al., (2007) *J. Adv. Space Res.* [4] Tompkins, S. and Pieters, C.M. (1999) *MAPS 34*, 25-41.

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