Constellation Targets

B. Jolliff and the LROC Cx Target Tracking Team
LEAG Meeting, LPI, Houston Update 11/17/09
Outline

- Cx Site Coverage Update
  - Commissioning Phase
  - Nominal Phase
  - How we monitor progress & plan future targeting

- Examples of Cx site coverage
  - Compton-Belkovich, 60° N
  - South Pole-Aitken Basin Interior Site, 60° S
  - Gruithuisen Domes, DEM example
  - Aristarchus, coverage
  - Reiner Gamma
Cx ROI targeting and tracking

- LROC Team tracks progress on NAC frame coverage of the 50 Constellation (Cx) targets
  - 10 x 10 – full coverage, photom & geom stereo, Pri 1
  - 20 x 20 – best effort, photom & geom stereo, Pri 3
  - 40 x 40 – best effort mosaics at low and high sun, Pri 4
Cx Targets: High-priority science 
targets in vicinity

Traverse map from R. Zeigler
Cx Target Tracking Activities

- LROC Team tabulating key parameters of Cx NAC frames
  - center Lat, Lon, orbit, date/time of acquisition
  - illumination geometry, possible stereo “pairs,” resolution
  - general assessment of quality
- Team members making preliminary NAC mosaics to illustrate coverage
- LROC wiki summary table - - updated ~ every two weeks
- Summary table of information on NAC coverage compiled ~ weekly.
- Tracking Team provides feedback to LROC Ops targeting team.
## Cx Commissioning Phase Summary of Coverage (non-polar sites)

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<th>% cover</th>
<th>10x10 km</th>
<th>20x20 km</th>
<th>40x40 km</th>
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</tbody>
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Example: Compton-Belkovich Th Anomaly

Lunar Prospector GRS Thorium
Compton-Belkovich Th Anomaly

Clementine Basemap

Gillis et al., 2002 LPS 33
Compton-Belkovich Th Anomaly
NAC Composite Commissioning Phase
Full res ~ 1.7 m/pix

DOY 241
i = 65
Compton-Belkovich Th Anomaly

10 km
Compton-Belkovich
Compton-Belkovich, Nominal Phase

M108569083, DOY 269

6.6 km

Full resolution = 66 cm/pix
South Pole-Aitken Basin Interior Site

Basemap: Composite Clementine Vis and LO global mosaic
South Pole – Aitken Basin Interior

WAC M110276595CE 604 nm

REACT Basemap

Bellingshausen

Lemaître

160°W

60°S
South Pole – Aitken Basin Interior

WAC M110276595CE
604 nm

NAC M103189611

M110269896, 0.55 m/pix

Nominal

Commissioning

i=59.7°

50 m

i=77.7°
South Pole – Aitken Basin Interior

WAC M110276595CE
604 nm

NAC M103189611
South Pole – Aitken Basin Interior

Nominal Phase Coverage
Gruithuisen Domes

- Nonmare extrusive volcanism
- One of the lunar “red spots”
- Link to thorium and possibly silica enrichment

Portion of Lunar Orbiter IV frame 151-H2, resolution ~60 m/pix, inc=21 degrees.
Gruithuisen LROC NAC

- Gruithuisen Gamma
  - Still need to image Gruithuisen Delta and the western portion of Gamma
- Two sets of observations
  - Incidence of 58° and 78°
  - Stereo pair
- Texture

Distinctive texture on the domes.

NAC frames M194783697L and R.

3.6 km

15 km
Topographic Shaded Relief

- Bottom of the negative topographic feature (NTF) is 250 m below the level of the mare plain.
- Top of the "peninsula" is ~725 m above the mare.
- "Plateau" of Gruithuisen Gamma is ~1500 m above the mare surface.

NTF

2.5 km
Aristarchus

Aristarchus-1

Aristarchus-2

Nominal Phase
Reiner Gamma