Geophysical Research Abstracts
Vol. 16, EGU2014-1511-7, 2014
EGU General Assembly 2014

Improving the Apollo 12 landing site mapping with Chandrayaan M3 data

Yann Chemin (1,2), Ian Crawford (1), Roberto Bugiolacchi (1), Huma Irfan (1), and Louise Alexander (1)
(1) Birkbeck College, University of London, U.K., (2) IWMI, Pelawatta, Sri Lanka

The geology of the Apollo 12 landing site has been the subject of many studies, including recently by Korotev et al. (2011) and Snape et al. (2013). This research attempts to bring additional understanding from a remote sensing perspective using the Moon Mineralogy Mapper (M3) sensor data, onboard the Chandrayaan lunar orbiter. This has a higher spatial-spectral resolution sensor than the Clementine UV-Vis sensor and provides the opportunity to study the lunar surface with detailed spectral signatures.

Mapping of FeO (wt%) and TiO_2 (wt%) is done using the methods of Lucey et al. (2000) and Wilcox et al. (2005). A FeO & TiO_2 processing module (i.feotio2) is made specifically for this research within the Free & Open Source Software GRASS GIS. Attempts will be made to estimate the lava flow thickness using the method of Bugiolacchi et al. (2006) and individual lava layers thicknesses (Weider et al., 2010). Integration of this new information will be put in perspective and integrated with previous work. Analysis from the combined higher spatial and spectral resolutions will improve the accuracy of the geological mapping at the Apollo 12 landing site.

References

Bugiolacchi, R., Spudis, P.D., Guest, J.E., 2006. Stratigraphy and composition of lava flows in Mare Nubium and Mare Cognitum. Meteoritics & Planetary Science. 41(2):285-304.

Korotev, R.L., Jolliff, B.L., Zeigler, R.A., Seddio, S.M., Haskin, L.A., 2011. Apollo 12 revisited. Geochimica et Cosmochimica Acta. 75(6):1540-1573.

Lucey, P.G., Blewett, D.T., Jolliff, B.L., 2000. Lunar iron and titanium abundance algorithms based on final processing of Clementine ultraviolet-visible images. J. Geophys. Res. 105(E8): 20297-20305.

Snape, J.F., Alexander, L., Crawford, I.A., Joy, K.H., 2013. Basaltic Regolith Sample 12003,314: A New Member of the Apollo 12 Feldspathic Basalt Suite? Lunar and Planetary Institute Science Conference Abstracts 44:1044.

Weider, S.Z., Crawford, I.A. and Joy, K.H., "Individual lava flow thicknesses in Oceanus Procellarum and Mare Serenitatis determined from Clementine multi-spectral data," Icarus, 209, 323-336, (2010).

Wilcox, B.B., Lucey, P.G., Gillis, J.J., 2005. Mapping iron in the lunar mare: An improved approach. J. Geophys. Res. 110(E11):2156-2202.