

Understanding the Kohlschutter crater on the Lunar Farside using M3 data

Nabamita Chaudhuri^{1*}, Kusuma K.N¹, S Aravind Bharathvaj¹ and Keerthana R¹

¹Department of Earth Sciences, Pondicherry University, Pondicherry-605014

*nabamitach93@gmail.com

Kohlschutter is a 60 km diameter crater on the lunar farside located at 15° N, 154° E. It is one among the few craters filled with a mare unit, which are rare occurrences on the lunar farside [1]. The area also exhibits enhanced level of thorium than the surrounding region [2]. We use images from Moon Mineralogy Mapper to understand the mineralogy of the crater and correlate them with the morphology in order to decipher its origin and evolution. I/F M3 images of the area was georeferenced and subsetting followed by MNF transformation for noise reduction. Integrated Band Depth (IBD) parameters for 1 and 2 um were derived and IBD colour composite was generated [3] [4]. The colour variations in the IBD colour composite were noted and the corresponding reflectance spectra were derived from M3 data to derive the mineralogical information. The wall of the crater shows bluish to green colour in IBD colour image with relatively features spectra and is considered to represent anorthositic composition. The floor of the crater shows three distinct units; two with bluish colour with features spectra and another with orange to yellow and yellowish-green colour. The blue color units have featureless spectra where as other one has distinct clinopyroxene spectra indicating basaltic composition. While correlating the mineralogy with the crater floor morphology, it was found that most of the crater floor is basaltic in nature with volcanic domes, sinuous rille, wrinkle ridge and feature suspected as caldera. The blue coloured area on IBD composite correspond with the rays of ejecta of anorthositic composition from surrounding highland crust.

References:

- [1] G. Jeffrey Taylor (1985) *Lunar Science*, 189-197. [2] Lawrence et al. (2003) *Journal of Geophysical Research*, 108, 5102 [3] Mustard. (2011) *Journal of Geophysical Research*, 116. [4] Besse et al. (2011) *Journal of Geophysical Resource*, 116.