

Lunar volcanic feature catalog for Dawn

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1. Introduction

Except for a number of low-resolution full-globe images obtained by the Hubble Space Telescope the surface of Vesta remains largely unknown. New image data from NASA's Dawn mission that will arrive at asteroid Vesta in July 2011 for a 9 month systematic mapping phase to investigate Vesta's geology [1]. This proposal of lunar analogues relies on medium to low-resolution image data from the Clementine and Lunar Orbiter missions as well as high-resolution image data obtained from the Lunar Reconnaissance Orbiter (LRO), Chandrayaan-1 and Kaguya camera experiments that are comparable to the expected Dawn instrument resolutions.

2. Features on Moon

Vesta is known to be a differentiated body with surface features probably analog to other planetary objects like the Earth's moon. Comparisons will be important in order to assess characteristic features that are potentially observed in the Dawn image data. In order to establish a basis for comparing structures we are currently developing a landform catalog which is intended to form a basis for comparing in particular volcanic and tectonic landforms to constrain the endogenic geological evolution, and impact structures, for example impact melt and crater forms as well as landslides in order to infer properties of target materials.

2.1. Volcanic features

Volcanic features will get a special part in our observation. Characterizing and interpreting volcanic structures will help to understand the geologic history of Vesta. Fig 1 shows several volcanic features on Moon to be expected as Vesta analogues.

3. Conclusions

This catalog relies on medium to low-resolution image data from the Clementine and Lunar Orbiter missions as well as high-resolution image data obtained from the Lunar Reconnaissance Orbiter (LRO), Chandrayaan-1 and Kaguya camera experiments that are comparable to the expected Dawn resolutions.

References

- [1] Russell, C.T., Capaccioni, F., Coradini, A., De Sanctis, M.C., Feldman, W.C., Jaumann, R., Keller, H.U., McCord, T.B., McFadden, L.A., Mottola, S., Pieters, C.M., Prettyman, T.H., Raymond, C.A., Sykes, M.V., Smith, D.E. and Zuber, M.T.: Dawn Mission to Vesta and Ceres, Earth Moon Planet, Vol. 101, pp. 65-91, 2007.

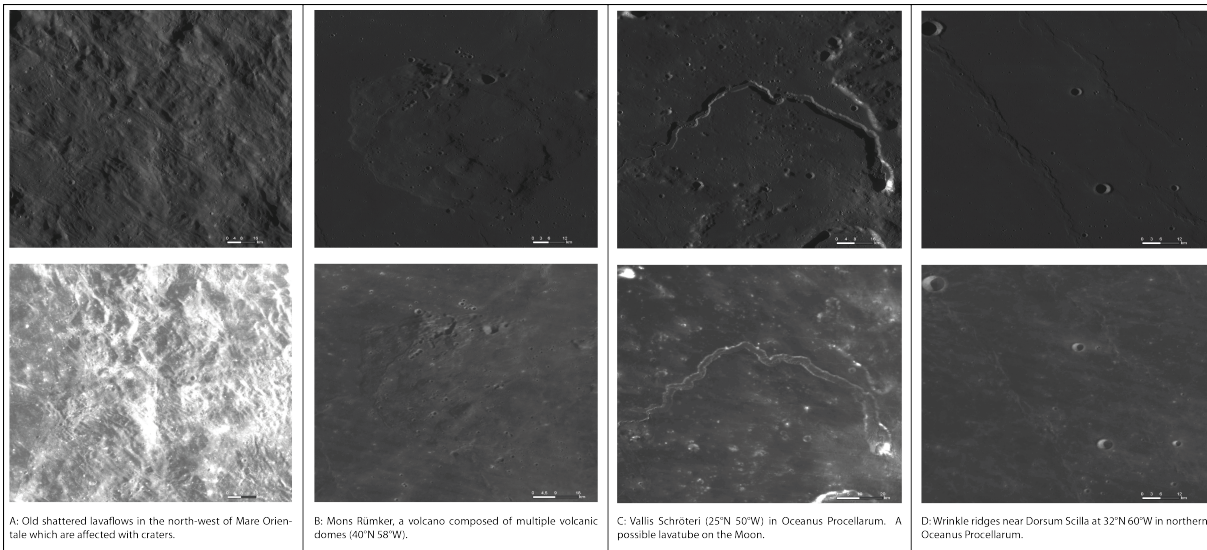


Figure 1: Several volcanic features on Moon. Shown in each case is on high resolution Lunar Reconnaissance Orbiter (LROC) WAC mosaic at the top (DLR) and lower resolution Lunar Orbiter Clementine UV/VIS Hybrid Mosaic at the bottom (NASA).