VOLCANIC FISSURE AND ASSOCIATED DEPOSIT ON THE NORTH MASSIF OF THE TAURUS-LITTROW VALLEY: SOURCE OF THE APOLLO 17 VLT BASALTS? N. E. Petro[1] (Noah.E.Petro@nasa.gov), H. H. Schmitt[2], B. Cohen[1], P. Hayne[3], D. Hollibaugh-Baker[1], D. Moriarty[1], J. Richardson[1], P. Whelley[1], [1]Planetary Geology, Geophys., and Geochem. Lab., Goddard Space Flight Center, Greenbelt, MD, [2]Dept. Eng. Phys., Univ. Wisconsin-Madison, P.O. Box 90730, Albuquerque, NM, [3]Dept. Astrophys. & Planet. Sci. and LASP, U. Colorado at Boulder

Introduction: In a recent analysis of the Taurus-Littrow valley [1, 2] a previously unnoticed ash debris deposit and a probable pyroclastic fissure source in the North Massif was recognized. Using a combination of Lunar Reconnaissance Orbiter Camera (LROC) Narrow Angle Camera (NAC) images and Mini-RF total power images the deposit was noted to have a distinct morphology (Fig. 1), stands ~30 m above the valley floor, and may have a fine-grained secondary ash mantle extending as far as 3 km from the base of the North Massif (Figure 1) [2]. Compositional analysis of the deposit by the Moon Mineralogy Mapper (M^3) suggests this deposit is spectrally distinct from the valley floor and may contain low or even very-low titanium basalt. We will explore the possibility that this fissure is a source of the VLT basalts sampled across the Taurus-Littrow Valley [3, 4].

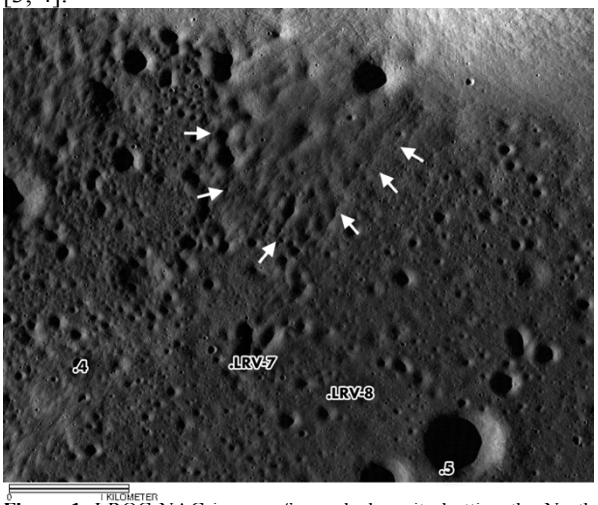

Figure 1. LROC NAC image of an ash deposit abutting the North Massif. The main portion of the ash deposit is marked by white arrows, a secondary ash mantle extends further south from the main deposit [2]. LROC image frame M101949648 with an incidence angle of 80.23°, north is up.

Moon Mineralogy Mapper: Spectra from M^3 from a variety of locations across the Taurus-Littrow Valley (and its surroundings) indicate a range of mafic compositions across the Sculptured Hills, valley floor, and in the debris deposit illustrated in Figure 1 [5]. A comparison of the 1 and 2 µm band centers of spectra from these locations is shown in Figure 2. The position of the debris deposit (in purple in Fig. 2) indicates that it is compositionally distinct from other valley compositions and may represent a low-Ti or VLT basalt. Additional work is needed to assess if this deposit could be a source of the VLT basalts sampled during Apollo 17.

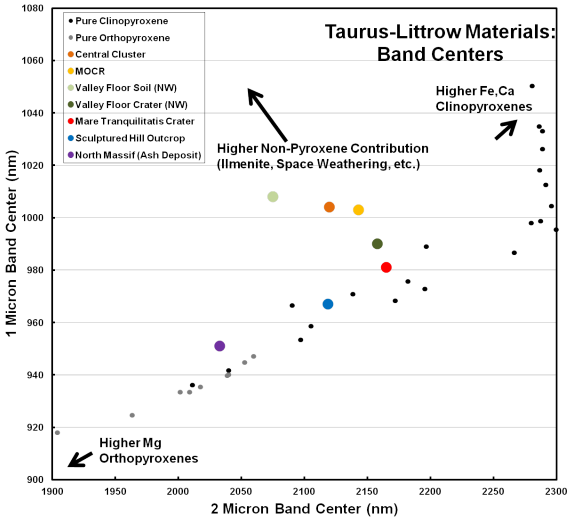

Figure 2. Plot of the 1 and 2 µm band centers for various locations in and near the Taurus-Littrow Valley and synthetic pyroxenes.

References:

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