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Analysis Of a "Dark Layer" as A Possible Local Source Of Dark Sand In Moreux Crater (Mars).

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Moreux Crater, a 135 km-diameter impact basin in the Protilus Mensae Region and its southern portion represents the dichotomy boundary, dislocating the regional scarp [1]. First analysis of reveals that the topographic setting of the crater dominates the wind flow direction [2]. Here we focus on dark sand material arising from a crevasse in the southern portion of Moreux crater.
This example gives spectral evidences for a mineralogical correspondence between the emerged dark material and the dark dunes on the floor of the crater. Analysis in the southern area of the crater provide further insights that the studied "dark layer" represents one of the possible local sources for the circulating dark material on the floor of Moreux Crater.
According to [3], [4], the southern portion of the crater is characterized by a flow of ice rich debris feature that have provided erosion/deposition of the crater surface over the rim and the wall.
This flow feature follows the topographic gradient of Moreux rim wall and create a sort of lobate flow along the valley [5]. The same valley is characterized by a slump deposit that incised it.
These depositional features have incised $\sim$10 km the Moreux wall and have a width that varies from 100 m till 200m. CRISM spectra extracted from the large dark dunes on the floor of the crater exhibit strong mafic signatures. Spectra extracted from the north dark dune field and the westerly barchans dunes have a predominant and wide absorption band $\sim$ 1250 μm compatible with olivine signatures.
Other spectral analysis reveal the presence of high-calcium pyroxene consistent with a band around 2.1 μm. Our last observations reveal that the pyroxene is the prevailing mineral of the Moreux large dark dunes. On the eastern downslope wall, we observed a slumped deposit characterized by a contemporary coverage by HiRISE dataset and CRISM observation.
CRISM spectra extracted from this last data reveal that the incisions are consistent with the pyroxene spectral band.
A combined analysis of HiRISE and CRISM data emphasizes that the aeolian dark material can be deposited into the crevasses of the slump deposits in the downslope wall eastern portion of the crater.
These "dark layers", such as one of the possible local sources, may be eroded and accumulated on the crater floor.
This first analysis gives further constraints to the previously obtained results [3] and it highlights that Moreux dark dunes encircle the central peak of the crater.
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