

MINERALOGICAL CHARACTERIZATION OF MARTIAN JEZERO CRATER FROM MRO CRISM HYPERSPECTRAL IMAGES

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ABSTRACT:

Martian mineral detection and mapping can provide important information and constraints on Martian aqueous history, which can be used to assess the potential habitability of Mars. Degrees of addressing the key question for Martian aqueous alteration are dictated by the depth and extent of grasping the Martian hydrous mineral. Therefore, it is important to know detailed minerals and chemical induction of the existence of water on the Martian surface at past or present. The Jezero crater located in the Nili Fossae region of Mars is the once-flooded crater, which has rich fan-delta deposit clays. It is a good case to study the clays and mineral components at Jezero crater, so as to know the geoloical processing and evolution on Mars. The Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) aboard the Mars Reconnaissance Orbiter (MRO) is a visible and near infrared spectrometer with enhanced spectral resolution, which provides an opportunity to map detailed and large-area mineralogy on Mars. In this paper, CRISM near-infrared spectral data are analyzed using the diagnostic absorptions features analysis along with spectral angle mapper (SAM), and mineral componenets at Martian Jezero region are recognized, including the phyllosilicate, carbonate, nitrates and tectosil. Some detailed characteristics and implications of minerals at Martian Jezero crater are further studied and discussed, including implications on Martian climate change and geological evolution.

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