

Reflectance Imaging Spectroscopy Data (Hyperspectral) for Mineral Mapping in the Orientale Basin Region on the Moon Surface

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Abstract : Mineral mapping on the Moon surface provides the clue to understand the origin, evolution, stratigraphy and geological history of the Moon. Recently, reflectance imaging spectroscopy plays a significant role in identifying minerals on the planetary surface in the Visible to NIR region of the electromagnetic spectrum. The Moon Mineralogy Mapper (M3) onboard Chandrayaan-1 provides unprecedented spectral data of lunar surface to study about the Moon surface. Here we used the M3 sensor data (hyperspectral imaging spectroscopy) for analysing mineralogy of Orientale basin region on the Moon surface. Reflectance spectrums were sampled from different locations of the basin and continuum was removed using ENvironment for Visualizing Images (ENVI) software. Reflectance spectra of unknown mineral composition were compared with known Reflectance Experiment Laboratory (RELAB) spectra for discriminating mineralogy. Minerals like olivine, Low-Ca Pyroxene (LCP), High-Ca Pyroxene (HCP) and plagioclase were identified. In addition to these minerals, an unusual type of spectral signature was identified, which indicates the probable Fe-Mg-spinel lithology in the basin region.

Keywords : chandryaan-1, moon mineralogy mapper, mineral, mare orientale, moon

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