



Spectral properties of the H05 Hokusai quadrangle on Mercury and relationship with the morpho-stratigraphic units

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H05 Hokusai (22.5°N–65°N, 0°–90°E) is one of the northern quadrangles of Mercury [1, 2]. It is characterized by different features, and includes several morpho-stratigraphic units. Smooth plains is the most widespread, covering ~43% of the entire quadrangle, followed by fresh crater material (~17%) and intercrater plains (~10%). The remaining part of the quadrangle contains intermediate plains (7%), degraded crater material (9%) and heavily degraded material (8%) [1]. Other morpho-stratigraphic units, such as smooth and hummocky crater floor material, account for a few percent [1]. Furthermore, this quadrangle includes part of the Hokusai ray system, the largest example on Mercury, and several pyroclastic deposits, including Nathair Facula, one of the highest-reflectance features observed on the planet, located at 480 km NE of Rachmaninoff crater [3, 4]. Spectral analysis based on specific spectral parameters represents a suitable approach to investigate compositional variations. We observed different spectral behavior among large parts of the morpho-stratigraphic units and surface features mapped by [1]. In particular, the units that show the highest spectral variability are the intermediate plains, smooth plains and fresh crater material, together with pyroclastic deposits and crater rays. Such a result indicates spectral variation related to the different units with implications for the geological processes on Mercury's surface.

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[1] Wright et al., 2018, LPSC 2018

[2] <https://planetarynames.wr.usgs.gov/Page/mercuryQuadMap>

[3] Rothery, D. et al., 2018 Oxford Research Encyclopedia of Planetary Science. Ed.

[4] Procter, L. et al., 2010, Science 329.