



Resolved NIR spectra of Mercury

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Mercury has been observed in June 2006 with the SOFI spectrometer at NTT. Resolved spectroscopy was performed in the 0.95-2.5 μm range with $R \sim 200$, by scanning the disk with the slit. The observations were acquired in greatest E elongation when Mercury was close to aphelion, so as to get an optimal trade-off between observing time, disk size, and illuminated fraction. The data consist in spectral cubes of typically 25 samples x 10 lines straddling the terminator. This provides a spatial resolution of ~ 500 km at the disk center, limited by the seeing. In addition to the usual calibration procedure, telluric absorptions were corrected using atmospheric modeling under very large airmass (~ 4), to allow refined spectral studies. These data are expected to provide a critical improvement in our understanding of Mercury's surface composition, before the Messenger and BepiColombo missions.

The illuminated region ranges from Beethoven to Homer. Little variations are observed between successive spectra, except a strongly variable spectral slope at short wavelengths due to scattering in the Earth atmosphere. However, a significant variation is detected along the slit in spectra located near the limb, in the vicinity of the Lermontov and Homer craters (longitude $\sim 320^\circ\text{E}$). The corresponding spectra exhibit a unique variation of some % short of 1.1 μm , consistent with Fe^{2+} absorption in mafic minerals. These spectra show no evidence of absorption in the 2 μm region, consistently with Ca-rich pyroxenes (e.g., hedenbergite), similarly to the interpretation of Warell et al 2006 in other regions. This area is known from Mariner 10 images to include exposures of dark, blue materials which have been interpreted either as crustal materials enriched in mafic minerals, or as pyroclastic deposits (Robinson and Hawke, LPSC 2001).

Study based on observations collected at the European Southern Observatory, Chile,

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