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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 by scanning the disk with the slit. The observations were acquired close to a favorable quadrature with maximum elongation, 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 day and night sides, with R˜200. 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, so far mainly based on visible spectra and disk-integrated spectra in the near-IR from the 80's. These observations will help detecting iron-rich silicates features, if present, thus quantifying simultaneously FeO contents and effects of soil maturity. This improved knowledge will be particularly fruitful in the frame of the coming space missions to Mercury, in particular ESA's BepiColombo and the Simbio-SYS instrument.

Study based on observations collected at the European Southern Observatory, Chile, ESO N° 077.C-00569.