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Introduction: Reflection and emission spectra of planetary surfaces contain extensive information on the surface properties and in particular on mineralogical composition. The compositional information is provided by diagnostic mineral absorption features affected by their composition and structure. To interpret features of planetary spectra in a right way, it is essential to study the spectral behavior of terrestrial analog materials using laboratory measurements.

The instrument: We present here a device built at DLR (Berlin) that enables us to measure emissivity spectra of analog materials in the mid-infrared wavelength region. We used a Fourier transform infrared spectrometer (Bruker IFS 88), purged with dry air, and equipped with a MCT-detector. All spectra were acquired with a spectral resolution of 4 cm^{-1}. For emissivity measurements the sample is placed in an Al-cup (3-cm in diameter) and heated from below to a constant temperature of 90°C. The samples' thermal radiation, emitted normal to the sample surface within a circular area of 2.5 cm diameter, is collected by an Au-coated parabolic off-axis mirror and reflected to the entrance port of the spectrometer. The emissivity of the sample is obtained by ratioing the background-corrected signals obtained for the sample and for the calibrated reference blackbody (e.g. [1],[2],[3]). More experimental details can be found in [4]. In the current setup we cover the range from 400 to 2000cm^{-1}.

The measurements: We started collecting spectra of various rock-forming minerals relevant for surfaces of terrestrial planets. To study the important influence of grain size on the spectra, different grain size fractions of the materials were prepared ranging from coarse to very fine grains. In addition, we started measuring the spectra of mineral mixtures to investigate the opportunity to apply a linear deconvolution method using the end-member minerals.

Application to PFS on MarsExpress: The emissivity data obtained will be used to build up a spectral library. The immediate purpose is to support the analysis of data from the Long Wavelength Channel (LWC) of the Planetary Fourier Spectrometer on MarsExpress. The LWC covers the range from 200-2000cm^{-1}. We will use a deconvolution approach as used by the TES team for preliminary analysis. In the future we plan to systematically enlarge the spectral database and focus on possible water-bearing minerals and volcanic minerals.

Application to MERTIS on Bepi-Colombo: MERTIS is a thermal infrared imaging spectrometer for the wavelength range from 7-14μm. The instrument is part of the payload of the Bepi-Colombo mission to Mercury. After selection currently a breadboard is being built. We will support the definition of scientific requirements by spectral measurements of Mercury relevant materials with fine grain sizes.

Conclusions: We will report first results on our newly started project to build up a spectral database in the mid-infrared wavelength range. We will show some applications to MarsExpress PFS measurements.

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