



Observations of the thermal emission of the surface of Mars by OMEGA / Mex after sunset

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We will report on night side observations of the surface of Mars by the OMEGA imaging spectrometer aboard Mars Express. The spectral range of OMEGA extends up to $5.1 \mu\text{m}$, which makes it possible to monitor surface temperature down to ~ 190 K. The OMEGA pixel size ranges from ~ 300 m at periapsis to 5 km at 4000 km with a maximum swath width of 128 pixels. Therefore, OMEGA can observe wide swaths at spatial resolutions which are intermediate between that of two thermal emission spectrometers, 3 km for TES on-board Mars Observer [1] and 100 m for THEMIS on-board Mars Odyssey [2]. The surface emissivity is expected to be lower at $5 \mu\text{m}$ ($\sim 85\%$) than at thermal IR wavelengths (e.g. 0.95 to 1 at $12.5 \mu\text{m}$). This parameter has an impact of a few K on the absolute evaluation of the temperature. The estimated uncertainty on temperature variations is < 1 K for temperatures > 190 K, < 0.5 K for temperatures > 200 K. Monitoring the evolution of surface temperatures after sunset provides constraints on the thermal inertia of surface material [1, 2]. Temperatures of up to 215 K have been observed 2 hours after sunset. While not primarily designed for thermal emission monitoring, OMEGA can therefore provide useful observations complementary to that of TES and THEMIS.

[1] B.M. Jakosky et al., J. Geophys. Res., 105, 9643-9652, 2000.

[2] R.L. Fergason et al., J. Geophys. Res., 111, CiteID E12004, 2006.

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