Europlanet TNA Report

PROJECT LEADER

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Date of TNA visit:	09-13/07/2012
Host laboratory:	PEL – DLR institute

The hot surface of Mercury: how the temperature variations affect the spectral behaviour of pyroxenes.

We measured a set of ten single-phase mineral comprehending common calcium–iron–magnesium phases of the 'pyroxene quadrilateral' (Diopside, Hedenbergite, Ferrosillite, Enstatite), all kinds classically subdivided into clino- (Ca-rich ones) and ortho-pyroxenes (Ca-poor ones). At Padua laboratories, these single phases have been deeply characterized at room conditions by single crystal X-ray diffraction, analyzed by electron micro-probe (WDS method, which allows high-accuracy chemical analysis thanks to its high peak resolution) and then reduced between 0 μm and 125 μm, according to Emery et al. (1998) on the size of the mercurian surface regolith. The emissivity measurements will be performed at PEL under vacuum at three different steps of induced temperature 70 K, 250 K and 450 K. At the moment we are elaborating discussing, and interpreting our “in-situ” data. We have planned to show our interpretation at international congresses next year (2013), and produce one ISI publication. Thanks to last TransNational Access experience, we have submitted to *Earth and Planetary Science Letters* the following paper: Helbert J., Nestola F., Ferrari S., Massironi M., Maturilli A., Redhammer G. J., Capria M. T., Carli C., Capaccioni F. And Bruno M. *Olivine thermal emissivity under extreme temperature ranges: implication for Mercury surface*.

REPORT APPROVED BY Doc. ALESSANDRO MATURILLI – PEL/DLR BERLIN.