

Global inventory of olivine-rich sites at the surface of Mars as determined by the OMEGA/Mars Express imaging spectrometer: B. Gondet, J-P. Bibring, Y. Langevin, F. Poulet and the OMEGA Science team, IAS, Université Paris-Sud, 91405 Orsay, France, gondet@ias.u-psud.fr.

Introduction: Olivine, one of the key mafic constituent of the surface of Mars has been identified in a variety of locations by the TES/MGS [1] and the OMEGA/Mars Express [2,3,4] investigations. In the near-infrared domain, OMEGA identifies olivine through a broad absorption centered around $1 \mu\text{m}$, which exhibits a very specific shape at longer wavelengths up to $1.7 \mu\text{m}$, distinct for fayalite and forsterite (Mg and Fe endmembers respectively). However, quantitative assessments of olivine abundances are difficult to derive, as they are strongly dependent on parameters such as the grain size; the same apply for the threshold of detection [4]. Olivine is present in both localized olivine-rich spots, with an enrichment of Fe-rich species, and within the large pyroxene-rich areas, mainly as forsterite, and with grain size lower than $100 \mu\text{m}$. In this paper, we present an overview of the location of the olivine-rich spots over the entire Mars surface.

Dataset: OMEGA has covered most of the surface of Mars from altitudes 1500 km to 4000 km, leading to a spatial sampling from 1.8 km/px up to 4.8 km/px. OMEGA acquires the spectrum in 352 contiguous spectral channels from 0.35 to $5.1 \mu\text{m}$.

Results: Olivine-rich spots are found in a number of craters, in particular within Vastitas Borealis (fig. 1), and close to the dichotomy (fig. 2). They are also identified around the large impact basins, such as Isidis, Hellas and Argyre (fig. 3).

Discussion:

We will present the global OMEGA olivine detection results, and discuss them in the framework of the magmatic and climatic history of Mars.

References: [1] Hoefen et al., (2003), *Science* 302, 627-630. [2] Bibring J-P. et al. (2005) *Science* 307, 1576-1581. [3] Mustard J.F. et al. (2005) *Science* 307, 1594-1597. [4] Poulet F. et al. (2007), submitted to *JGR-Planet*.

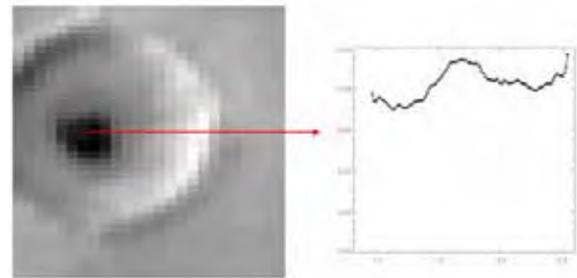


figure 1: dark dunes within a crater in Vastitas Borealis (65.2 N, 177.9E)

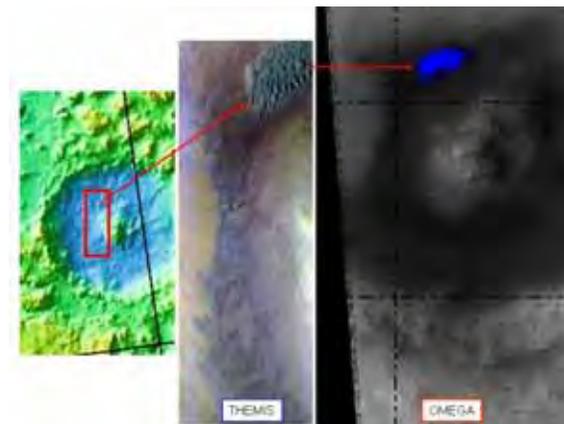


figure 2: olivine-rich dunes within the Moreux crater (40N, 45E).

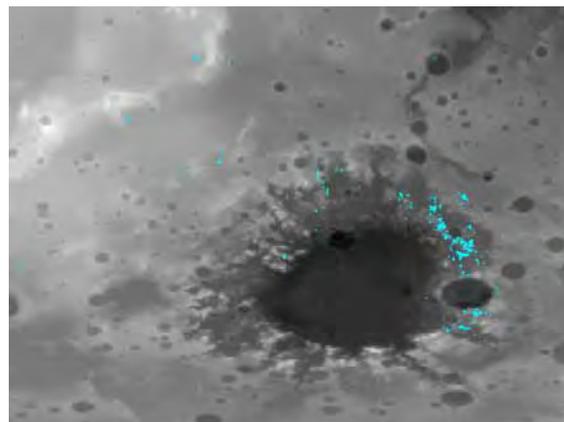


figure 3: olivine-rich spots around Argyre