COMPOSITION OF WHITE ROCK FORMATION WITHIN POLLACK CRATER AS INFERRED FROM THE OMEGA/MEX DATA. B. Gondet[1], J-P. Bibring[1], Y. Langevin[1], F. Poulet[1] and the OMEGA Science team, [1] IAS (Université Paris-Sud, F-91405, France), gondet@ias.u-psud.fr).

Introduction: Pollack Crater is a 90 km wide impact basin, centered at 8 S and 25 E. The images provided by Mariner 9 (1972), Viking and Mars Global Surveyor indicated in this crater an area, some 15 km large, much brighter than the surrounding terrain, thus labeled as "White Rock". The MGS/Mars orbiter Camera (MOC) images acquired in September 2000 shown that the light-toned material of White Rock forms steep cliffs, interlaced with valleys covered by dark, windblown sand. A key feature of White Rock is the layering observed, which suggested that the material has been deposited as sediments. Some authors proposed that White Rock consists in water-processed sediments (1), having possibly hosted living organisms (2). As viewed by optical imagery, White Rock was considered representative of evaporitic material having been formed in a number of Martian topographic basins that would have harboured long-standing bodies of water: such formations would thus be considered as favourable targets of potential astrobiological interest.

The first relevant remote compositional mapping, by MGS/TES (3) indicated no evidence of an aqueous origin. Here we present the results of the OMEGA/Mars Express mineralogical mapping of these areas.

Dataset: OMEGA has covered the Pollack Crater area in a global mode at spatial sampling 2-4 km. In addition, along the 24 months of the nominal mission, six high resolution tracks were acquired, 2 from altitude of 600 km (OMEGA footprint of 700 m) and 4 from 290 km (OMEGA footprint of 330 m) (fig.1). OMEGA acquires for each resolved pixel the spectrum from 0.35 to 5.1 µm in 352 contiguous spectral channels.

Results: In figure 2, four NIR spectra are shown, of areas 1) inside White Rock (black), 2) outside White Rock, within the crater floor (red), 3) in a dark valley within White Rock (blue), and 4) in a bright spot beyond the northern rim of the crater (green). All spectra exhibit the two diagnostic feature of pyroxene, at ~1 µm and ~2.0 µm. These spectra are strikingly similar, except for their albedo. No evidence for minerals distinct from the mafic ones constituting the crater floor is found in any pixel corresponding to the supposedly sedimentary material. In particular, no hydrated materials (diagnostic features at 1.4 and 1.9 µm) have been detected in this area. The OMEGA data are thus consistent with a purely physical processing of the material, with no chemical alteration involved, and in particular no role played by water.

References: [1] e.g. Williams S.H. and Zimbelman J.R. (1994), *Geology, 22*, 107-110. [2] Russsell M.J., Ingham J.K., Zedef V., Maktav D., Sunar F., Hall A.J. and Fallick A.E. (1999), *J. Geol. Soc. London, 156*, 869-888. [3] Ruff S.W., Christensen P.R., Clark R.N., Kieffer H.H., Malin M.C., Bandfield J.L., Jakovsky B.M., Lane M.D., Mellon M.T. and Presley M.A.. (2001), *J. Geophys. Res. 106*, 23921-23927.

Figures:

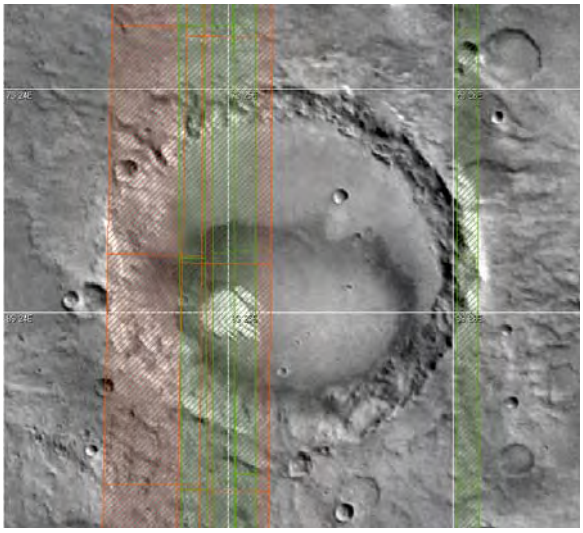
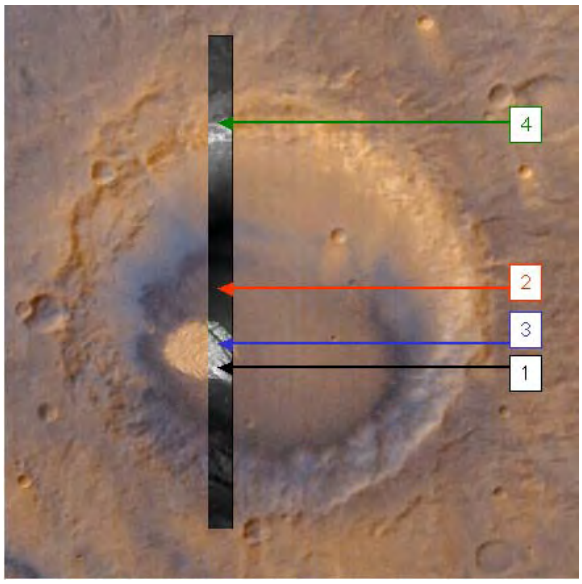


Figure 1. OMEGA tracks within the Pollack Crater: observation altitude range from 290 km (green) to 600 km (red).



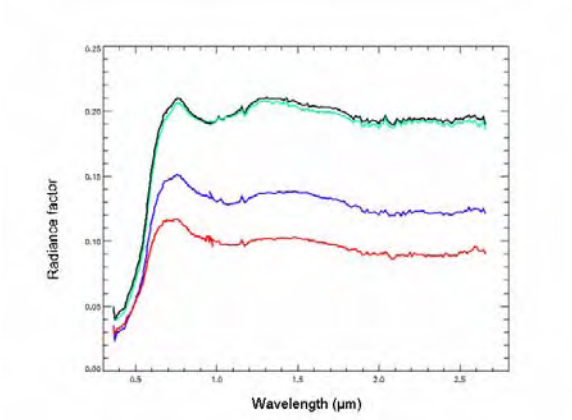


Figure 2. OMEGA VIS/NIR spectra (above) of four areas indicated by relevant color arrows (left) in the context image, on which the OMEGA track has been superimposed.