



Mineralogy of the magnetic anomaly site South of Syrtis derived from OMEGA/Mars-Express hyperspectral data

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Mars Global Surveyor has detected a strong magnetic field of lithospheric origin on Mars. It is at least one order of magnitude larger than the Earth's lithospheric magnetic field. Both its geographical distribution and its high intensity have raised the question of the origin of these anomalies. The possible associated materials are mainly iron bearing minerals (magnetite, hematite, pyrrhotite, pure iron,...). Plausible processes include volcanism or plutonism, i.e. thermal remanent magnetization (TRM), or hydration and weathering, i.e. crystallization remanent magnetization (CRM).

Spectra of mafic minerals (pyroxenes and olivines) and their alteration products (lizardite, serpentine,...) display diagnostic absorption bands in the visible-infrared range. The OMEGA imaging spectrometer onboard Mars Express provides hyperspectral images of the martian surface. We use this unprecedented data set to investigate mineralogical heterogeneities and study the possible link with local magnetic anomalies in the Syrtis Major area. In the first year of operation, OMEGA observed the surface of Mars at high resolution (~300 m/pixel with very narrow swaths) in the southern hemisphere and a medium resolution (2 to 4 km with consequently much larger swaths) in the northern hemisphere. We therefore first focused our analysis in an area south of Syrtis which has both a significant magnetic anomaly and a sufficiently dense spatial coverage with OMEGA. These spectra display characteristic absorption bands of olivine, orthopyroxene and clinopyroxene. Two of these spectra also present a

1.91 μm hydration band. Although the different mineral maps show variations, there is no wide scale correlation with the magnetic anomalies suggesting no surface anomaly.