



Magnetic field anomalies in and around Hellas Basin, Mars

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Mars Global Surveyor stayed in orbit around Mars during 10 years. After sampling about 20% of the surface at low-altitude (below 200 km), more than 30,000 orbits were flown, at a quasi-constant altitude of 400 km. These numerous measurements allow some data selection, in order to minimize the external fields and to optimize the internal field characterization. Such scheme is applied around Hellas Basin, the largest impact crater on Mars. The first observation is that the magnetic field is very weak above the basin, below 10 nT. This is usually interpreted at a basin-scale demagnetization, related to the impact processes that took place after the Martian dynamo shut down (reheating, shock, excavation and fracturation effects). However, the 'weak' field area is not perfectly circular, and there are more magnetic anomalies to the North-East than to the South-West. In particular, some local maxima are found close to volcanic centers (Hadriaca Patera, Tyrrhena Patera and Pityusa Patera), although the origin of the later is unconfirmed. We compare magnetic anomaly maps to topography, gravity as well as to mineralogy maps derived from OMEGA/MarsExpress, to infer the nature and characteristics these anomalies, and find that they are not co-located with the paterae, but rather shifted by a few degrees.