



Magnetic Anomalies Near Apollinaris Patera and the Medusae Fossae Formation, Mars

L. Hood (1) and B. Langlais (2)

(1) Lunar and Planetary Laboratory, University of Arizona, Tucson, Arizona 85721 USA (lon@lpl.arizona.edu), (2) CNRS UMR 6112, Laboratoire de Planetologie et Geodynamique de Nantes, Universite de Nantes, 2 rue de la Houssiniere, 44000 Nantes, France

Mars Global Surveyor magnetometer measurements were obtained over limited areas during the aerobraking phase of the mission at ~ 90 - 200 km altitude and globally during the mapping phase at ~ 360 - 420 km altitude. A correlation of one martian crustal field anomaly with a volcanic construct, Apollinaris Patera (A.P.), has previously been reported (Langlais, B. and M. Purucker, *Planet. Space Sci.*, v. 55, p. 270, 2007). Here, we report more detailed mapping and modeling of the available MGS data over this construct and nearby volcanic units along the hemispheric dichotomy boundary. A map of the magnetic field magnitude at the mapping altitude contains a broad anomaly that correlates approximately with a large-scale volcanic plateau that adjoins the A.P. construct on its southwestern side. The volcanic plateau is mapped as part of the Medusae Fossae Formation (Lucus Planum) and may consist of pyroclastic flow deposits up to several km thick originating at one or more now-buried vents. Modeling of the A.P. anomaly using a near-surface disk source indicates that the horizontal scale size of the source is about twice as large as the surface diameter of the construct. Preliminary modeling of the Lucas Planum anomaly is consistent with a broad (500 - 1000 km) near-surface source although sources consisting of a series of deeply buried magma chambers cannot be excluded. Possible implications for martian dynamo history will be discussed.