



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

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Mars Global Surveyor magnetometer measurements were obtained over limited areas during the aerobraking phase of the mission at  $\sim 90 - 200$  km altitude and globally during the mapping phase at  $\sim 360 - 420$  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 Lucus 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.