

## **VARIATION OF MAGNETIC SOURCE LAYER CHARACTERISTICS ON MARS**

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The sources of the strong magnetic anomalies on Mars are thought to reside at depth and be characterized by single domain magnetite or multidomain hematite. Few strong constraints exist on the location and thickness of the sources or source layers, other than an average global depth (40-50 km) obtained from field inversions. Based on correlated magnetic, gravity and geologic features in the region of the global dichotomy boundary between 30-60°N and 50-90°E, we conclude that the magnetic source resides at shallow depth (within 1 km of the surface), at least locally in this region. The global dichotomy is a fundamental feature of the Martian topography, and divides the relatively young northern lowlands from the highly cratered, older southern highlands. The shallow depth we infer here is in contrast to the global average source depth, which may be more heavily weighted towards the stable highlands crust, where the most intense magnetic anomalies occur. The shallowing (and possibly thinning) of the magnetic source layer is consistent with the gradual thinning of the crust towards the dichotomy boundary, and may indicate erosion of the subcrustal layer.