MAGNETIC FIELD AT MARS: PRELIMINARY RESULTS OF THE MARS GLOBAL SURVEYOR MISSION M. H. Acuna, J. E. P. Connerney, P. J. Wasilewski, H. V. Frey, NASA Goddard Space Flight Center, Greenbelt, MD 20771; R. P. Lin, K. A. Anderson, C. W. Carlson, J. McFadden, D. W. Curtis, D. Mitchell, Space Science Lab., University of California, Berkeley, CA; H. Reme, A. Cros, J. L. Medale, C. Mazelle, J. A. Sauvaud, C. D'Uston, Centre d'Etude Spatiale des rayonnements, Toulouse, France; S. J. Bauer, University of Graz and Space Research Inst., Graz, Austria; P. Cloutier, Space Science Dept., Rice University, Houston, TX; M. Mayhew, National Science Foundation, Washington, DC; N. F. Ness, Bartol Research Inst., University of Delaware, Newark, DE.

The Mars Global Surveyor magnetometer experiment (1) measured spatially localized magnetic anomalies of small scale length (up to 200 to 300km)which must be due to remanent magnetism in the Martian crust. The existence of these magnetic spots certainly provides evidence that Mars probably had a dynamo generated global magnetic field at some point, but which is non existent today. This crustal magnetism record comes from a narrow band (30-40˚ N)circling the planet.

We considered the data from the SNC meteorites (6, 7) where both the NRM and SIRM were given. The NRM range is considered to be 0,002 to 0.2 10-3 Am 2kg-1. To account for the martian crustal magnetism we need magnetic source rocks with a broad range of magnetic mineral content.

We compared the locations for anomalies with magnitudes over 100 nT with surface features and surface geology. The anomalies fall into two reasonably distinct groups. One group clusters between 20 and 32 west all at the eastern edge of the Chryse impact basin (1,2,3,4). Some of the anomalies appear in association with craters or not. The other group of anomalies are in western Mars at or just south of the crustal dichotomy boundary zone and eastward in a zone between 30-40N and 270-356 west longitude. Therefore we find that the largest crustal anomalies in the present data set are not randomly distributed in longitude. They are distributed between 270 and 30 west longitude coincident with the most heavily cratered and oldest terrain at this latitude. The source of these anomalies requires rocks with more magnetic material than the SNC meteorites. Also, there is no clear correspondence between anomalies and craters, but additional factors such as age and lithology must be considered This will be one of the important future outcomes of the anomaly analyses when depth to source and modeling parameters are available.

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