



Martian Valley Networks and Inner Channels as seen by the Mars Express High Resolution Stereo Camera

R. Jaumann (1), D. Reiss (1), S. Frei (1), F. Scholten (1), K. Gwinner (1), T. Roatsch (1), K.-D. Matz (1), E. Hauber (1), V. Mertens (1), H. Hoffmann (1), J. W. Head (2), H. Hiesinger (2), M. H. Carr (3), G. Neukum (4) and the HRSC Co-Investigator Team

(1) Institute of Planetary Research, German Aerospace Center (DLR), Berlin, Germany; (2) Department of Geological Sciences, Brown University, Providence, USA; (3) U. S. Geological Survey, Menlo Park, USA; (4) Remote Sensing of the Earth and Planets, Freie Universitaet Berlin, Germany.

Martian valley networks have been cited as the best evidence that Mars maintained flow of liquid water across the surface. However, internal structures associated with a fluvial origin within valleys like inner channels, terraces, slip-off and undercut slopes are extremely rare on Mars (Malin and Edgett, 2000; Carr and Malin, 2000). So far only a small part of the Martian surface has been covered with high-resolution imagery and this may explain the lack of those features. Nevertheless these features, if present would prove sustained flow on the surface. Our objective is to characterize the internal structure of valley networks based on small-scale structures that are related to fluvial processes. In order to map those features we used data of ESA's Mars Express High Resolution Stereo Camera (HRSC) (Neukum et al., 2004). As HRSC is a stereo camera, the three-dimensional structure of small inner valley features can be resolved providing quantitative information on transport rates and mass balances. Although the age differences between the valley floors and the surroundings are large and therefore stand for low average erosion rates, the estimated discharges indicate higher erosion activities and therefore shorter periods for the valley formation, which may be caused by episodic flooding events (Jaumann et al., 2005).

Carr, M. H., and M. C. Malin, *Icarus*, 146, 366-386, 2000; Jaumann, R., et al., submitted to *GRL*, 2005; Neukum, G. et al, *ESA Special Publications SP-1240*, 2004; Malin, M. C., and K. S. Edgett, *Lunar and Planet. Sci. [CD-ROM] XXXI*, abstract 1189, 2000.