



## **SPIDER PATTERNS IN THE MARTIAN CRYPTIC REGION**

**G. Portyankina**, W.J. Markiewicz

Max Planck Institut für Aeronomie, Katlenburg-Lindau, Germany  
(portyankina@linmpi.mpg.de)

Mars Orbiter Camera (MOC) onboard of Mars Global Surveyor (MGS) has taken many images of radially converging dendritic patterns. These so called spiders are unique patterns of South Polar Regions. We have looked through MOC image archive to collect images containing spiders patterns. The total area examined is southward of 70°S. 178 images of separate spiders or spider ravines were found. All spiders on the found images were categorized with respect to their properties such as size, albedo and presence or absence of different albedo material redistributed over them. We tried to find correlations between spider properties and their location and Martian seasons. A descriptive model for formation of spider patterns was proposed by H.H. Kieffer (2000, International Conference on Mars Polar Science and Exploration, p. 93). This model includes a process of cleaning dusty CO<sub>2</sub> ice to an ice slab transparent for almost all wavelength of solar radiation that can reach the surface of Mars through its atmosphere. To validate the above model we first have to show that the time scale for cleaning of the CO<sub>2</sub> is shorter than that of its complete sublimation. In our model dust grains embedded into a 1-meter thick CO<sub>2</sub> slab ice receive Solar radiation which amount changes during the day and according to the annual solar cycle and latitude of the place inside cryptic region. All radiation received by the dust grain goes into sublimation of the ice underneath it; the grain sinks to the bottom of the sublimed volume and in this way moves downward. The time needed for cleaning a 1-meter thick CO<sub>2</sub> slab ice by such a process was calculated for different particle shapes and orientations. Our initial estimates of the time scales critical for the cleaning process show that for this aspect the model is feasible.