P074-P002 Time: May 30 17:00-18:30

SUBSURFACE GEOLOGICAL MODELS OF MARS AS TEST FOR MARSIS RADAR INVESTIGATION IN MARS EXPRESS

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The subsurface of Mars is very little known. However, there is a la rge variety of geological processes and provinces on the surface, which are likely related to different subsurface structures. We therefore suggest models for a few localities on Mars that will provide a range of inputs for testing the resolution of the MARSIS radar instrument which will fly on the Mars Express mission.

The selected areas are: 1) chaos areas where indications are strong for occurrences of ground ice and possibly gas hydrates 2) canyons and adjacent areas where layering outcrops on the walls 3) active volcanic areas where recent lavaflows and steep geothermal gradient occur 4) sedimentary deposits of various thickness and lithology (lacustrine, fluvial, breccias) 5) polar caps and related deposits. This stratigraphical analysis will help us to understand the capabilities of the MARSIS instrument to detect geological features in the upper crust of Mars. The models are done with respect to differences in electric properties between different layers as well as differences of variation in layer thickness. Attention is given to how the response to these differences is affected by variations of the crust in depth.