



## **Polar regions on Mars observed by the HRSC experiment on Mars Express**

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Already early during commissioning, the High Resolution Stereo Camera (HRSC) experiment on Mars Express acquired images of the south polar region away from periapsis yielding a spatial resolution of about 50 to 80 m/pixel. Special emphasis was given to obtain multispectral data at highest possible spatial resolution while stereo data were not acquired. A complete mapping campaign of the south polar region in stereo and color is planned at the end of the nominal mission. Because of the wide range in illumination conditions, the observation in orbit 103 (solar longitude 348) was also used as a test case for a first-order photometric correction. Atmospheric phenomena detected in this orbit include a dust cloud at the edge of the polar cap and the presence of haze close to the terminator. The OMEGA imaging spectrometer onboard Mars Express identified three different units in the south polar cap with a CO<sub>2</sub>-ice rich unit mixed with some water ice, an H<sub>2</sub>O-ice rich unit with some CO<sub>2</sub>-ice on the scarps around the residual cap, and a unit consisting of dust mixed with H<sub>2</sub>O-ice but without CO<sub>2</sub>-ice. All three units described by OMEGA could be recognized within the HRSC image based on their differences in albedo. The HRSC color data allowed to map and differentiate these units in greater detail. Within the CO<sub>2</sub>-ice rich residual cap, two different terrains can be distinguished with a brighter, rough terrain and a smooth, slightly bluish terrain exhibiting the highest occurrence of swiss-cheese like features, indicating differences in their sublimation stages.

A mapping campaign of the Martian north polar region has started in December 2004, again from higher altitudes and with a spatial resolution of 60 m/pixel. Meanwhile, the periapsis has drifted further north and spatial resolutions of up to 15 m/pixel will be achieved. First results of the north polar observations will be presented that include the presence of clouds and changes in the ice coverage, the polar layered deposits and circumpolar eolian processes.