



One year of Mars Express science operations planning

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Europe's Mars Express mission has achieved the milestone of 1 Martian year in orbit, and has now started its extended mission. During the 23 months of the nominal mission the spacecraft has orbited Mars 2400 times and the 7 payload experiments have acquired scientific data revealing many new aspects of Mars and its history. During the 3 phases of favorable illumination conditions HRSC (stereo camera) covered 24% of the Martian surface at a resolution better than 20 m/pixel, OMEGA (hyper spectral imaging) covered the entire surface with its global resolution mode of a few km resolution. After its deployment in June 2005, MARSIS (sub-surface radar) is providing insight into the Martian sub-surface structure for the first time. During the different Martian seasons SPICAM and PFS have made measurements of the temperature, pressure and composition of the atmosphere, and ASPERA studied atmospheric escape processes. The MaRS radio Science experiment performed occultation, gravity, and bi-static radar experiments. Mars Express data is available in the Planetary Science Archive.

This paper describes the science operations for Mars Express throughout the nominal mission, emphasizing 1) how the original science mission goals have been achieved, 2) the impact of varying constraints, such as illumination, eclipses, occultations, during different mission phases on the science return of the mission, and 3) special operations such as the link demo tests between the Mars Express lander communications package and the MER rovers.