

MARS EXPRESS: MISSION STATUS, RECENT FINDINGS AND FUTURE PLANS

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Mars Express has entered its second decade in orbit in excellent health. Characterization of geological processes and landforms on Mars on a local-to-regional scale by HRSC camera constrained the martian geological activity in space and time and suggested its episodicity. Six years of spectro-imaging observations by OMEGA allowed correction of the surface albedo for presence of the atmospheric dust and revealed changes associated with the dust storm seasons. Imaging and spectral imaging of the surface shed light on past and present aqueous activity and contributed to the selection of the Mars-2018 landing sites. More than a decade long record of climatological parameters such as temperature, dust loading, water vapor, and ozone abundance was established by SPICAM and PFS spectrometers. Observed variations of HDO/H₂O ratio above the subliming North polar cap suggested seasonal fractionation. The ASPERA observations of ion escape covering a complete solar cycle revealed important dependences of the atmospheric erosion rate on parameters of the solar wind and EUV flux. Structure of the ionosphere sounded by MARSIS radar and MaRS radio science experiment was found to be significantly affected by the solar activity, crustal magnetic field as well as by influx of meteorite and cometary dust. The new atlas of Phobos based on the HRSC imaging was issued.

Mars Express remains one of ESA's most scientifically productive missions and has fully accomplished its objectives set for 2015-2016. The mission provides unique capabilities amongst the flotilla of spacecraft investigating Mars. The science case for the mission extension till the end of 2020 has just been submitted. The science objectives for 2017-2018 are confirmed and fully achievable. The observation programme proposed for 2019-2020 includes both augmenting the coverage and extending long-time series, as well as new elements and potentially new discoveries. It will be boosted by collaboration and synergies with NASA's MAVEN, ESA-Roscosmos ExoMars-2016 Trace Gas Orbiter and other missions. The talk will give the mission status, review the recent science highlights, and outline future plans.