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AMELIA: THE EXOMARS ENTRY, DESCENT AND LANDING SCIENCE.

Abstract

Schiaparelli the Entry Demonstrator Module (EDM) of the ESA ExoMars Program entered into the martian atmosphere on 19th October 2016; although it did not complete a safe landing on Mars, it transmitted data throughout its descent to the surface, until signal was lost about 1 minute before the expected touch-down on Mars' surface.

The Atmospheric Mars Entry and Landing Investigations and Analysis (AMELIA) experiment aimed at exploiting the Entry Descent and Landing System (EDLS) engineering measurements for scientific investigations of Mars' atmosphere and surface. The data recorded during the different phases were intended to be used for an accurate trajectory and attitude reconstruction and for the retrieval of atmospheric vertical profile to study the atmospheric structure, dynamics and static stability and to characterize the landing site context.

Despite the ultimate failure of Schiaparelli to land safely, sufficient EDL data was returned in order to reconstruct the trajectory and attitude of the EDM and retrieve atmospheric profiles over the altitude range from 121 km to 4 km above the surface.

We will report the results on the atmospheric reconstruction in terms of the assessment of the atmospheric science and put the experience and lessons learned into perspectives for the ExoMars 2020 mission.