

The DREAMS experiment on-board the Schiaparelli lander of ExoMars mission

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Abstract

The DREAMS package is a suite of sensors for the characterization of the Martian basic state meteorology and of the atmospheric electric properties at the landing site of the Entry, descent and landing Demonstration Module (EDM) of the ExoMars mission. The EDM will land on Meridiani Planum in October 2016, during the statistical dust storm season. This will allow DREAMS to investigate the status of the atmosphere of Mars during this particular season and also to understand the role of dust as a potential source of electrical phenomena on Mars. DREAMS will be the first instrument to perform a measurement of electric field on Mars.

DREAMS FM has been completely developed and tested and it has been delivered to ESA for integration on the Schiaparelli lander of the ExoMars 2016 mission.

Launch is foreseen for January 2016.

1. DREAMS

The ExoMars mission is carried out by European Space Agency (ESA) in cooperation with the Russian

federal Space Agency (Roscosmos). It is a two-steps mission. It includes an orbiter, the *Trace Gas Orbiter*, and an EDM (Schiaparelli), that will be launched on January 2016, and a descent module and surface platform, plus a rover, to be launched in 2018.

DREAMS will be accommodated on the EDM. It includes six sensors: MarsTem (thermometer), DREAMS-P (pressure sensor), DREAMS-H (humidity sensor), MetWind (2-D wind sensor), MicroARES (electric field sensor), SIS (Solar Irradiance Sensor), a CEU (Central Electronic Unit) and a battery (Figure 1).

The development of the instrument is at its final stage, with the Flight Model delivered to ESA in spring 2015 and ready for the integration on the EDM.

The system has been fully characterized and calibrated.

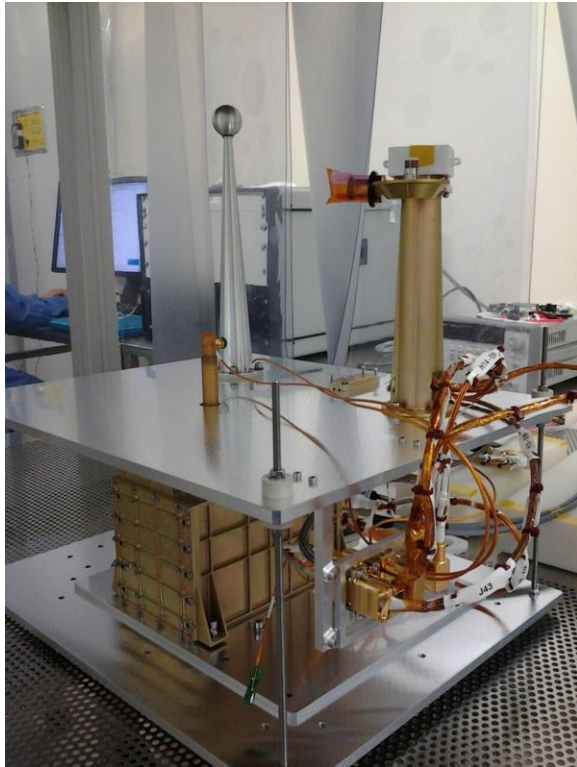


Figure 1: DREAMS Flight Model

Field experiments have been also performed in the Sahara desert (Figure 2) in 2013 and 2014 during the dust storm season to test sensor response to harsh environment.

Sahara tests have also allowed the study of the rising and evolution of dust storms and their effects on the electric properties of the atmosphere. This study will prepare the analysis of the data that will be acquired on Mars by the instrument DREAMS.

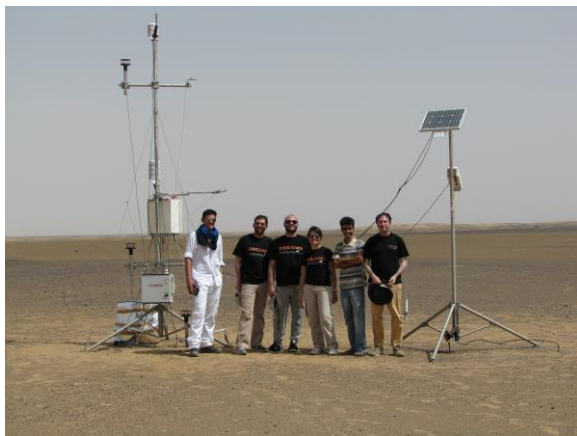


Figure 2: Field test campaign in the Sahara desert.

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