Geophysical Research Abstracts
Vol. 12, EGU2010-13330, 2010
EGU General Assembly 2010

Development of miniaturized instrumentation for Planetary Exploration and its application to the Mars MetNet Precursor Mission

Hector Guerrero and the Hector Guerrero Team

INTA - Instituto Nacional de Técnica Aeroespacial, Programas Espaciales y Ciencias del Espacio, Torrejón de Ardoz, Spain (guerreroph@inta.es, +34915201945)

In this communication is presented the current development of some miniaturized instruments developed for Lander and Rovers for Planetary exploration. In particular, we present a magnetometer with resolution below 10 nT and mass in the range of 45 g; a sun irradiance spectral sensor with 10 bands (UV-VIS-near IR) and a mass in the range of 75 g. These are being developed for the Finnish, Russian and Spanish MetNet Mars Precursor Mission, to be launched in 2011 within the Phobos Grunt (Sample Return).

The magnetometer (at present at EQM level) has two triaxial magnetometers (based on commercial AMR technologies) that operate in gradiometer configuration. Moreover has inside the box there a triaxial accelerometer to get the gravitational orientation of the magnetometer after its deployment. This unit is being designed to operate under the Mars severe conditions (at night) without any thermal conditioning.

The sun irradiance spectral irradiance sensor is composed by individual silicon photodiodes with interference filters on each, and collimators to prevent wavelength shifts due to oblique incidence. In order allow discrimination between direct and diffuse ambient light, the photodiodes are deployed on the top and lateral sides of this unit. The instrument is being optimized for deep UV detection, dust optical depth and Phobos transits. The accuracy for detecting some atmospheric gases traces is under study.

Besides, INTA is developing optical wireless link technologies modules for operating on Mars at distances over 1 m, to minimize harness, reduce weight and improve Assembly Integration and Test (AIT) tasks. Actual emitter/receiver modules are below 10 g allowing data transmission rates over 1 Mbps.