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MetNet precursor units high level shock testing

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The MetNet MMPM Mission is implemented in collaboration with Finnish Meteorological Institute (FMI), Lavochkin Association, Russia (LA), Russian Space Research institute (IKI) and Instituto Nacional de Tecnica Aeroespacial, Spain (INTA). MetNet in situ observation lander mission for Martian atmospheric science is based on a new semi-hard landing vehicle called the MetNet Lander (MNL). The MNL will have a versatile science payload focused on the atmospheric science of Mars. INTA has developed two units for this mission the Tri-axial magnetometer (MOURA) that is located on the top of the outer part of the inflatable breaking unit and the Solar Irradiation Sensor (MetSIS) that will be placed on top of the MetNet Lander extensible boom. The Solar Irradiance Sensor is equipped with wireless optical communication capabilities. The first terminal (OWLS-MetSIS-I), is situated in the bottom of the Solar Irradiance Sensor. The second terminal of the wireless communication system is placed on the base of the meteorological boom. The Units are going to be mounted on a penetrator type of lander that will reach Martian surface at a speed of 200 km/h. This impact introduces shock loads of 500 g during 15-20 ms. One of the main challenges for the qualification of the units was to develop a testing facility able to reproduce the shock levels suffered by the different units on the landing stage. A testing facility was developed at INTA by using a modified air pressure cannon, a deceleration chamber is mounted on the tip of the cannon. The units are mounted on a polystyrene bullet, a housing for the units is performed on the bullet. There is also mounted on the bullet, an electronic board with an accelerometer and a memory to record the data for each impact test. Each of the units was successfully tested on this facility achieving the required shock levels.

Biography

J Azcue completed his BS Degree in Mechanical Engineering in 1998 at Parks College of Saint Louis University. He is one of the Mechanical Engineers of the GISCU laboratory at the Spanish National Aerospace Institute for the past nine years, performing tasks in the areas of mechanical design, integration and tests of payloads. Over the past three years, he has been in charge of the design group of the cryogenic filter wheel for the SAFARI instrument on the ESA/JAXA SPICA mission. Previously, he has also worked as a Structural Engineer for Tecnicas Reunidas at Madrid, Spain.

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