IAF SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – missions current and future (3A)

Author: Mr. Charles Yana
Centre National d'Etudes Spatiales (CNES), France, charles.yana@cnes.fr

Mr. Emilien Gaudin
Telespazio, France, emilien.gaudin@cnes.fr
Mr. Remi Lapeyre
Centre National d'Etudes Spatiales (CNES), France, remi.lapeyre@cnes.fr
Mr. Gabriel Pont
Centre National d'Etudes Spatiales (CNES), France, gabriel.pont@cnes.fr
Dr. Elizabeth Barrett
Jet Propulsion Laboratory - California Institute of Technology, United States,
elizabeth.barrett@jpl.nasa.gov
Mr. Eugene Chu
Jet Propulsion Laboratory - California Institute of Technology, United States, eugene.y.chu@jpl.nasa.gov
Dr. Philippe Lognonné
IPGP, France, lognonne@ipgp.jussieu.fr
Mr. Sébastien de Raucourt
Institut de Physique du Globe de Paris, France, deraucourt@ipgp.fr
Mr. Taoufik Gabsi
IPGP, France, gabsi@ipgp.fr

# INSIGHT TO FSS: SEISMOMETERS FROM MARS TO THE MOON

**Abstract**

Onboard the NASA InSight mission, the French seismometer SEIS has been operating on Mars for almost four years, collecting an unprecedented amount of high quality seismic data. InSight has been allowing the Science community to unveil the interior of Mars through seismic activity monitoring. However the martian environment is particularly hostile for surface robots relying on solar panels for energy collection and distribution, and the way the SEIS instrument is operated after four years is quite different from what was initially envisioned. Nevertheless, thanks to the success of the InSight mission and the outstanding performances of the SEIS instrument, NASA has selected the seismometer to be the main instrument of the Farside Seismic Suite (FSS) mission, set to land on the Moon in 2024 as part of the NASA CLPS program. The Moon environment is very different from the Mars environment, and the communication scenarios are very specific, especially since FSS will be landing on the far side of the Moon, in Schrödinger Crater. The use of a yet to be launched orbiter to relay data, the Moon day duration (28 Earth days) and the absence of atmosphere on the Moon surface lead to a very specific operational concept and mission scenario for FSS with respect to InSight. This paper will present both mission specifics and focus on the challenges and requirements of operating a seismometer on Mars and on the Moon, and how similar hardware lead to very different operational concepts and processes. The latest results of the InSight mission will be presented and in particular the recent operations within a very low energy collection context and power limited environment. The FSS inheritance from InSight will also be introduced, as well as the resources optimization and technical synergies that can be reached between the two missions.