



The Very Broad Band sensor of SEIS/InSight : validation from cruise to Mars ground.

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After its successful landing the 26th of November 2018, the NASA InSight Mission Lander has deployed on the ground of Mars its main instrument SEIS (Seismic Experiment for Interior Structure) dedicated to probe the deep internal structure of the planet.

A short presentation of the Very Broad Band (VBB) sensor instrument working principles, design and expected performances (5Hz down to 0.01 Hz bandwidth and a goal of $10^{-9} \text{m.s}^{-2}/\text{Hz}^{1/2}$) will be done by the SEIS team to highlight the goals, the environment and the risks of the mission.

We will then go through the process which allowed the Seismometer to have been installed for Science and how performances have been validated. It will cover the tests activities during assembly, integration and tests on Earth, during cruise phase and on Mars ground. The onsite installation process will as well be described. All along those phases, the VBB main vital signals, its functionalities and its key performances checked and characterized will be showed. It includes power consumption, thermal dynamics of the enclosures (SPHERE, Wind and Thermal Shield), sensor thermal sensitivities and tuning (Thermal Compensating Actuator), mechanical abilities (Levelling and Recentering), mechanical characteristics, and finally performances (Gains and Noise). First results on Mars showed a nominal behavior of the VBBs.

Following the deployment and its commissioning, the science monitoring phase will start for a nominal duration of 2 years and thanks to the International cooperation, hopefully, the results will give the Geophysical community significant science returns to increase the knowledge on Mars interior and on the past of our solar system.

References:

[1] Lognonné et al., in press, Space Science review, 2019.

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