

NASA SBIR/STTR Technologies

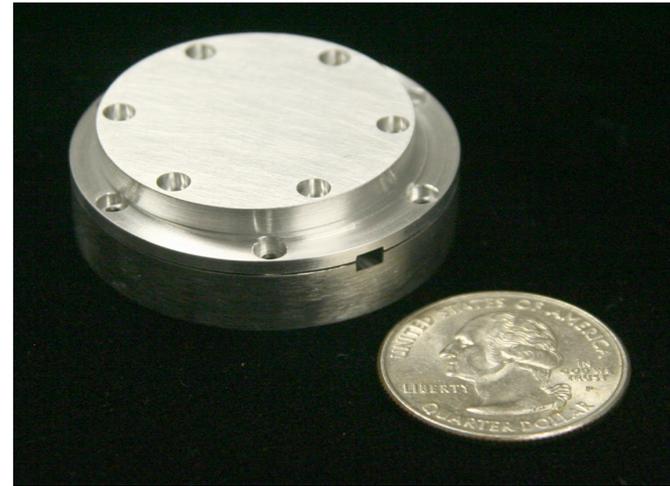
S1.09-9258 - Planetary-Whigs: Optical MEMS-Based Seismometer



PI: Dominique Fourquette
Michigan Aerospace Corporation - Ann Arbor, MI

Identification and Significance of Innovation

- The optical MEMS-Based seismometer is highly sensitive to ground acceleration (10 nano-g sensitivity).
- Bandwidth up to 40 Hz and dynamic range of 120 dB.
- Immune to electro-magnetic interference (EMI).
- The design is compact, light weight and low power (160 mW per channel).
- The acceleration information is an easily digitized voltage output.



Seismometer component holding the sensing element

Estimated TRL at beginning and end of contract: (Begin: 3 End: 4)

Technical Objectives and Work Plan

Technical Objectives:

- Objective 1: Design of the optical MEMS element for lunar applications -- Material selection.
- Objective 2: Definition of the instrument design considerations specific to the lunar environment.
- Objective 3: Complete seismometer design for lunar and planetary applications.

Work Plan:

- Task 1: Requirements definition
- Task 2: Optical MEMS element design
- Task 3: Environmental conditions and mitigation approaches
- Task 4: Design of the instrument

NASA Applications

Seismometer for planetary applications and space applications such as satellite drag measurements.

Non-NASA Applications

This ultra-sensitive low-cost seismometer will have applications in earth sciences, geological research, and nuclear reactor and building safety. The seismometer also has applications in homeland security for perimeter surveillance.

Firm Contacts

Dominique Fourquette
Michigan Aerospace Corporation
1777 Highland Drive, Suite B
Ann Arbor, 481082285
PHONE: (734) 975-8777
FAX: (734) 975-0239

NON-PROPRIETARY DATA