High-Frequency Sensors

PASSCAL Passive High-Frequency Sensors:

- 4.5 Hz 3-channel geophones (Sercel L-28-3D or GeoSpace Y-28/GS-11-3D)
- 4.5 Hz vertical geophones for Texan or Multi-Channel Digitizers
- 40 Hz vertical geophones for Texan or Multi-Channel Digitizers
- FairfieldNodal ZLand 3-Channel Sensor

Features:

High-frequency sensors are very rugged seismometers, often termed geophones, that cover higher frequency bands of 4.5 Hz to 600 Hz. PASSCAL's high-frequency geophones are passive velocity transducers (coil/magnet geophones). These sensors are most often used in active-source experiments, but can be used to record a variety of local and regional weak-motion signals and noise in the bandwidth.

PASSCAL also has feedback accelerometers for recording strong-motion signals, ranging from DC to high frequency.

Types of Projects:

- Active source (land and off-shore excitations)
- Glacial Movements
- Local Earthquake
- Aftershock Studies

Other Documents:

- PASSCAL Sensor Comparison Chart
- Policy for the use of PASSCAL Instruments

A Note on MEMS Sensors:

Geophones have historically been passive analog devices and typically comprise a spring-mounted magnetic mass moving within a wire coil to generate an electrical signal. Some recent sensor designs have been focused on MEMS technology which generates an electrical response to ground motion through an active feedback circuit to maintain the position of a small piece of silicon. The response of a coil/magnet geophone is proportional to ground velocity, while MEMS (Microelectromechanical) devices usually respond proportional to acceleration. MEMS typically have a much higher noise level (50 dB velocity higher) than geophones and are best used in strong motion applications or active seismic.

(excerpt from Wikipedia, 2009)

MEMS sensors are not yet suitable for the kinds of experiments PASSCAL Principle Investigator's (PI's) usually undertake.