

Program for Array Seismic Studies of the Continental Lithosphere

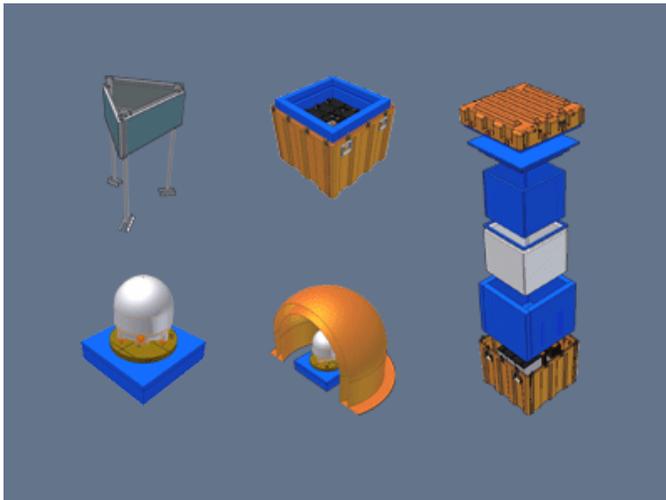
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PASSCAL Polar Support

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PASSCAL currently supports approximately 60 experiments per year worldwide, with 5-10% currently funded by the National Science Foundation (NSF) Office of Polar Programs (OPP). Polar projects commonly require a level of support that is several times that of seismic experiments in less demanding environments inclusive of very remote deployments (e.g. Tibet). In order to ensure OPP funded Antarctic

projects the highest level of success, we have established a PASSCAL Polar Program and have secured funds from OPP to support new and ongoing experiments in Antarctica.



The primary focus of PASSCAL's Polar support efforts are: 1) Developing successful cold station deployment strategies. 2) Collaborating with vendors to develop and test -55°C rated seismic equipment. 3) Establishing a pool of instruments for use in cold environments. 4) Building a pool of cold station ancillary equipment. And 5) Creating a resource repository for cold station techniques and test data for seismologists and others in the polar sciences community.

Our strategy for designing cold-hardened seismic systems is driven by the need to maximize heat efficiency and minimize payload while maintaining continuous recording throughout the Polar winter. Power is provided by a primary Lithium Thionyl Chloride battery pack and is backed by a secondary, solar charged AGM battery pack. Station enclosures are heavily insulated utilizing vacuum-sealed R-50 component panels and rely on instrument-generated heat to keep the dataloggers within operating specification. Although insulated, broadband sensors are operated close to ambient temperature.

In parallel with PASSCAL's internal Polar support efforts, IRIS and LUNAVCO in 2006 received NSF MRI funding to develop a power and communications system for remote autonomous GPS and seismic stations in Antarctica. In 2007, IRIS was awarded a second NSF MRI to begin establishing a pool of seismic instrumentation and station infrastructure packages designed to operate PASSCAL experiments in Polar Regions.

