



Remote Antarctic GPS and seismic network technologies for year-round operation and remote data retrieval

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Antarctica presents researchers with one of Earth's harshest environments. Field instrumentation must operate in extreme low temperatures and survive sustained, extreme wind conditions. Year-round measurements at sites remote from the sparse permanent operational bases require a source of power through the polar night, lacking sun for up to 6 months. Data transfer is limited by the lack of availability of most commercial communication systems. Access to sites in the Antarctic interior is only by small aircraft and is only possible in the short summer period. The costs incurred by the U.S. Antarctic Program (USAP) to provide deep-field air transport, and the large infrastructure underpinning it, far exceed those for instrument deployment elsewhere in the world. The geodetic and seismologic science communities require continuous measurements at remote locations in the Antarctic interior in order to make the next 'great leap forward' in geophysical understanding.

The IRIS/PASSCAL and UNAVCO facilities are working with the GPS and seismic community to design, integrate, test, and make available a scalable, reliable, power and communication system optimized for available logistic transport modes and for deployment and operation in severe polar environments. A paramount goal throughout the development process will be to minimize the logistical support required for installation, data collection, and maintenance of the remote systems. This effort will serve the immediate need for instrument systems to be deployed during the International Polar Year (IPY; 2007-2009), but is also intended to initiate a continuous process of developing and supporting state-of-the-art in autonomous remote station operations as power and communications technologies evolve. This effort builds on the already

substantial knowledge base to develop a tested, reliable, and cost effective system that will be available to the broader GPS and seismic research community through the UNAVCO and IRIS/PASSCAL facilities.