



Design of a seismo-acoustic station for Antarctica

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In the last years, it has been shown how seismological studies in Antarctica can give plenty of information in many Earth Science fields. Moreover, also the acoustic investigations are now considered a powerful tool to provide insights for many different objectives, such as analysis of regional climate-related changes and study of the volcanic degassing and explosive activities. However, installation and maintenance of scientific instrumentations in Antarctica can be really challenging. Indeed, these instrumentations have to face the most extreme climate on the planet, and so they have to be tolerant of very low temperatures and robust enough to survive strong wind speeds. Moreover, one of the most critical task is powering a remote system year-round at polar latitudes. In this work, we present a novel seismo-acoustic station, designed to reliably work in polar region. To enable year-round seismo-acoustic data collection in such a remote extreme environment, a hybrid powering system was used integrating solar panel, wind generator and batteries. A power management system was specifically developed to either charge the battery bank or divert energy surplus to warm the enclosure or release the excess energy to the outside environment. Finally, due to the prohibitive environmental conditions in most of the Antarctic installation sites, the station was designed to be quickly deployed.