Geophysical Research Abstracts,
Vol. 10, EGU2008-A-01433, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-01433
EGU General Assembly 2008

Permafrost and active layer monitoring in the Maritime Antarctic. Objectives and preliminary results of the PERMAMODEL-PERMADRILL project during 2007-08 Antarctic campaign.

M. Ramos (1) and the PERMAMODEL-PERMADRILL Team
(1) Department of Physics, University of Alcala, Spain.

Antarctica stores 90% of the ice on Earth and the continent and Southern Ocean characteristics are determinant factors for the climate on the Southern Hemisphere and for Earth's atmospheric and cryospheric systems evolution. Approximately 3% of the Antarctic continent is ice-free, but most of that is underlain by perennially frozen ground (permafrost). The Maritime Antarctic islands are significant areas with ice-free terrain underlain by permafrost (e.g. Livingston Island - 62°39'S, 60°21'W and Deception Island - 62°43'S, 60°57'W). The location of these islands close to the mean air annual temperature isotherm of -2°C, and their position near to the Antarctic Peninsula region is reflected in a very high sensitivity of permafrost to climate change. Soil temperature monitoring in the active layer is a basis for the quantification of atmosphere-ground heat exchange and therefore for the study of climate change impact on the ground and permafrost. Monitoring of temperatures and temperature gradients in permafrost allows for a quantification of the net effect of climate over prolonged periods (several years to several decades). The main objective of the international project PERMAMODEL-PERMADRILL (a collaboration of Spanish, Portuguese and Swiss researchers) during the 2007-2008 Antarctic campaign is to drill 2 boreholes in permafrost on the islands of Livingston and Deception. The boreholes are intended to have a depth of 20-25m and thus reach below the depth of zero annual amplitude that is estimated to be about 15m. Ground temperature monitoring and meteorological stations will be installed near these boreholes and other complemen-

tary CALM-S protocol stations, in order to monitor the evolution of the temperature series in the permafrost and also in the active layer. At the surface geomorphological and snow conditions will be also monitored. The measurements will be integrated in the international networks CALM-S (Circum-polar Active Layer Monitoring) and GTN-P (Global Terrestrial Network - Permafrost / WMO, FAO and IPA) in order to attain long-term data series (10-25 years). This action is associated to the international core IPY programs TSP (Thermal State of Permafrost) and ANTPAS (Antarctic and sub-Antarctic Permafrost, Periglacial and Soil Environments).