



THERMAL REGIME AND METEOROLOGICAL PARAMETERS MONITORING IN ALPINE PERMAFROST ROCKWALLS: THE AIGUILLE DU MIDI' SITE (Mont Blanc massif)

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During the last decades the alpine region has revealed to be extremely sensitive to ongoing increasing temperatures and permafrost has been identified as one of six cryospheric indicators of global climate change. In high-mountain regions the permafrost evidences are scarce and punctual, while its occurrence is wide and its distribution is mainly controlled by complex topography and ground cover condition. In such environment, steep bedrock slopes are abundant and contain a significant proportion of permafrost whose thermal response is very fast compared to permafrost in gentle morphology because of its less amount of ice content. Due to logistical problems like accessibility, costs, weather conditions, etc..., monitoring sites in such environments are few, while an increase of measurements of rockwall temperature and system energy balance is fundamental for the calibration and validation of both physical and statistical permafrost models.

Started in the framework of the French-Italian project PERMAdataROC (www.fondazionemontagnasicura.org/multimedia/permadataroc/) and presently developed within the EU co-funded project PermaNET (www.permanet-alpinespace.eu), several monitoring sites have been equipped during the last years in the Western Alps from a collaboration of Swiss, French and Italian researchers, with the aim to cover the widest range of climatic, topographic, morphological and geological conditions. In such network, the Aiguille du Midi can be considered one of the most advanced site in high-mountain permafrost research thanks to the convergence of several instrumental approaches, but also a "cooperation laboratory" among different research groups. The site has been chosen because of its elevation, aspects variability, steep slopes and accessibility all over the year.

In details, ARPA Valle d'Aosta in collaboration with University of Zurich started in 2006 the monitoring of rockwall thermal regimes and of some meteorological parameters on the different faces of Aiguille du Midi south tower. Surface rock temperature is measured at three different depths (3, 30 and 55 cm) by means of miniloggers Geoprecision M-Log6 specifically adapted for rockwall installation. Air temperature and relative humidity is measured only on south and north faces by means of miniloggers Geoprecision M-Log5 inside a radiation shields. Meteorological parameters are measured with an automatic weather station adapted and installed directly on rockwall. Incoming and outgoing solar radiation is measured parallel to rock face in both shortwave and longwave frequencies; wind speed and direction is measured perpendicular to rockface. All parameters are measured with hourly frequency except for the meteorological ones, recorded every 10 minutes. The analysis of available datasets highlight and quantify the great variability of near sub-surface temperatures in comparison to topographic and the seasonal variability of meteorological conditions. During poster session this results will be analyzed and discussed.