



Englacial temperatures increasing and impact on the stability of an hanging glacier in Mont Blanc area.

Christian VINCENT, Adrien GILBERT, Patrick WAGNON, and Delphine SIX
CNRS, Glaciology, Saint Martin d'Hères, France (vincent@lgge.obs.ujf-grenoble.fr)

Temperature measurements have been performed in deep holes drilled in ice at Col du Dôme (4250 m) in 1994, 2005 and 2009, and at Col de la Brenva (4550 m) in 2007. These observations reveal an obvious atmospheric warming. The 1994 temperature profile was already far from steady state temperature profile. Results from a heat transfer model reveal that englacial temperature increase comes from atmospheric temperature rise and from latent heat resulting from surface meltwater refreezing at depth. This warming could have important impacts on the stability of hanging glaciers frozen to their beds in case they reach melting point. Temperature measurements performed in the hanging glacier of Taconnaz in the valley of Chamonix show that the bed of this glacier is not very far from the melting point. This hanging glacier could threaten a village if a large mass of ice would become unstable. For this reason, further temperature measurements and numerical simulations are needed to know when the bedrock could reach the pressure melting point. This study is performed in the framework of the european project ACQWA.