



Laboratoire de Glaciologie et Géophysique de l'Environnement

Séminaire

Jeudi 26 Novembre 2015, 11h00
salle L. LLiboutry, LGGE

F. Gimbert

Un nouveau regard sur les interactions mécaniques glace/eau/sédiments par la sismologie

Mechanical interactions between ice, water and Earth's crust sediments control many aspects of the Cryosphere and landscape dynamics. Subglacial channel flow controls glacier sliding by reducing basal effective stresses, river and subglacial flow shape landscapes by transporting sediments and ocean waves enhance sea-ice drift by fracturing the ice cover. All these processes are major controls on future environmental changes and associated risks in the context of climate change, but remain poorly known due to a lack of observations.

In this talk, I will show that seismic noise observations provide unique insights into the complexity of these mechanical processes. I will present theoretical frameworks that allow us to relate the physics of interest with seismic noise properties. I will demonstrate that physical quantities like subglacial channel pressurization levels, subglacial channel size, subglacial and river sediment transport and sea ice packing properties can be continuously monitored from noise. I will discuss how these observations can be used to improve physical laws in existing models of glacier/sea-ice dynamics and crustal erosion. These monitoring capabilities combined with integrated studies in mountainous settings such as the Alps will allow important knowledge to be gained on the dynamics of these various surface processes.

Subglacial channels



Ice cave at Mendenhall glacier (Alaska)