

Master subject:
Environmental seismology in glaciology: on the use of ambient seismic noise to track glacial cavities and water flow

Keywords: environmental seismology, glaciology, ambient seismic noise, modal analysis, mechanics, hydrodynamics

Profile and skills required

Master's degree or engineering degree in mechanics, physics, or geophysics, with strong interest in data processing. A broad interest in geosciences and/or natural hazards would be appreciated.

Project description

Within the national project on glacial and periglacial-related hazards, our team has deployed seismic sensors on various glaciers in the Alps. The goal is to better understand the mechanics of deformation and cracking of ice in glaciers and permafrost slopes, develop new imaging and monitoring tools for glacial and periglacial hazards, and develop early warning procedures to identify precursors and failure. The final goal is to help governmental and private stakeholders manage the risks.

During this project we will perform ambient seismic noise processing of continuous data obtained on or next to various glaciers. Relative seismic velocity changes obtained from passive imaging and coda wave interferometry, together with passive coda wave decorrelation, will be compared to meteorological data and microseismic catalogs to identify the environmental forces that drive crack propagations. Seismic noise energy in various frequency bands will be tracked to identify possible intra- or sub-glacial water flows. V/H and H/V spectral ratios will also be monitored to track possible intra- and sub-glacial cavities.

Field experiments in the Alps will be part of the internship.

Please send your CV to : Eric.Larose@univ-grenoble-alpes.fr and Noelie.Bontemps@univ-grenoble-alpes.fr

Project supervisors:

E. Larose, N. Bontemps, L. Moreau and L. Baillet

