ECOLE LEMANIQUE DES SCIENCES DE LA TERRE
DES UNIVERSITES DE GENEVE ET DE LAUSANNE

Master ès Sciences in Earth sciences

Seismicity and seismotectonics of *<your region of choice>*

Contact persons

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Context

Earthquake statistics are generally robust over longer time periods and for large areas. For the regional scale, however, variability in seismic activity exists both because of spatial heterogeneity of (inherited) faults, and due to the inherent temporal variability of the phenomena. The latter is even more interesting in the uppermost crust, where seismic swarms can occur frequently. In this research project the region of interest is to be agreed upon with the candidate, the rough target area size being ca. 1-10'000 km² (similar to the size of a larger Swiss canton), for which a good quality earthquake catalogue exists. A pre-requisite for this topic is the ability to use a programming language (e.g. matlab, python), including writing some parts of new codes. For the seismotectonics interpretation, a general understanding of the geological-geodynamic context is expected. Several other aspects can be flexibly discussed with the supervisors.

Aims and Methods

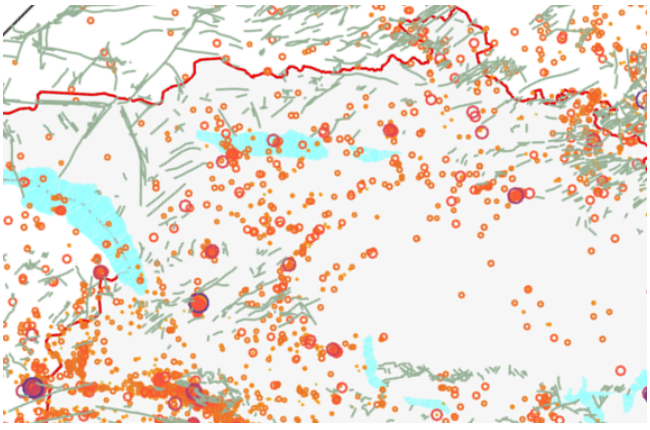
- Access and manage seismic catalogue data
- If relevant, download and process seismic waveform data
- Assess spatial and temporal patterns of seismicity
- Interpret tectonic earthquakes, their relation to faults, recognize and characterize swarms
- Define other goals of interest and the pathway to find the answers

References

Jennaton L, Guiguet R, Thouvenot F, Daix N (2007) The 16,000-event 2003–2004 earthquake swarm in Ubaye (French Alps). J Geophys Res 112:B11304. doi:10.1029/2006JB004878

Hetényi G, Epard JL, Colavitti L, Hirzel AH, Kiss D, Petri B, Scarponi M, Schmalholz SM, Subedi S (2018) Spatial relation of surface faults and crustal seismicity: a first comparison in the region of Switzerland. Acta Geod Geophys 53:439-461. doi:10.1007/s40328-018-0229-9

Vouillamoz N, Mosar J, Deichmann N (2017) Multi-scale imaging of a slow active fault zone: contribution for improved seismic hazard assessment in the Swiss Alpine foreland. Swiss J Geosci 110:547-563. doi:10.1007/s00015-014-0269-0



Website

https://www.unil.ch/orog3ny

Prerequiste

Geophysics across scales