

[Invited] Detecting slow slip events and accompanying tectonic tremor in geodetic and seismic data, using machine learning

*Bertrand ROUET-LEDUC¹

1. DPRI, Kyoto University

Faults can accommodate stress in a variety of slip modes, from dynamic rupture to slow slip events and aseismic slip. Among these slip modes, slow slip events and often-accompanying tremor remain among the most elusive and poorly understood.

Unraveling the interactions between slip modes is at stake: while laboratory experiments point to aseismic nucleation generally preceding dynamic rupture, observations in the field are far from systematic, and more the exception than the rule.

However, the difficulty in detecting transient slow slip events, either seismically or geodetically, points to a possible observational gap that may explain the rarity of slow deformation detected prior to dynamic earthquakes.

In this presentation, the use of machine learning to improve the detection of slow slip events and accompanying tectonic tremor will be explored, as a tool to fill this observational gap, both in seismic data and in geodetic data.