



## Searching for aseismic slip in subduction zones

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Aseismic slip is known to occur in subduction zones. This phenomenon is of paramount importance for understanding earthquake hazard, and for estimating the potential for future mega-thrust events. Aseismic slip is however difficult to detect except for the largest cases, for which geodesy is the most useful type of data.

Here, we propose a systematic detection of aseismic slip events, based on seismicity data. We search for transient increases in background seismicity rate in subduction zones, that would indicate the presence of aseismic slip.

To that purpose, we make use of an ETAS model in space and time, to distinguish earthquakes due to background seismicity from aftershocks. We optimize the model parameters, and test the sensitivity of the results with changes in parameters. Given the 'best' model, we measure the statistical significance of the departure of the local (in time and space) background rate with the 'normal' background rate. Significant departure then indicates the need to temporarily increase the background rate in order to explain the observed earthquake occurrences. We thus can single out such episodes of aseismic transients, and characterize their duration and spatial extent.