In this model,

the **intermittence** and **migrations** of tremor activity in subduction faults

EGU General Assembly 2021

Clogging and un-clogging of the subduction plumbing system may generate tremor-like patterns

Gaspard Farge, Claude Jaupart, Nikolaï Shapiro

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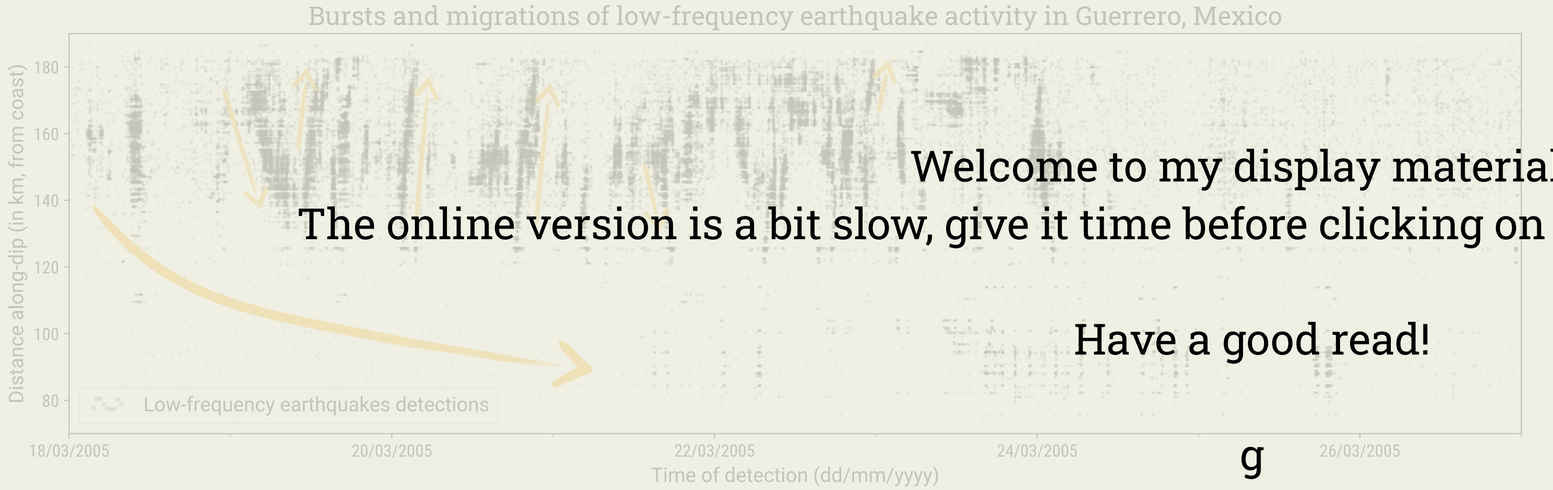

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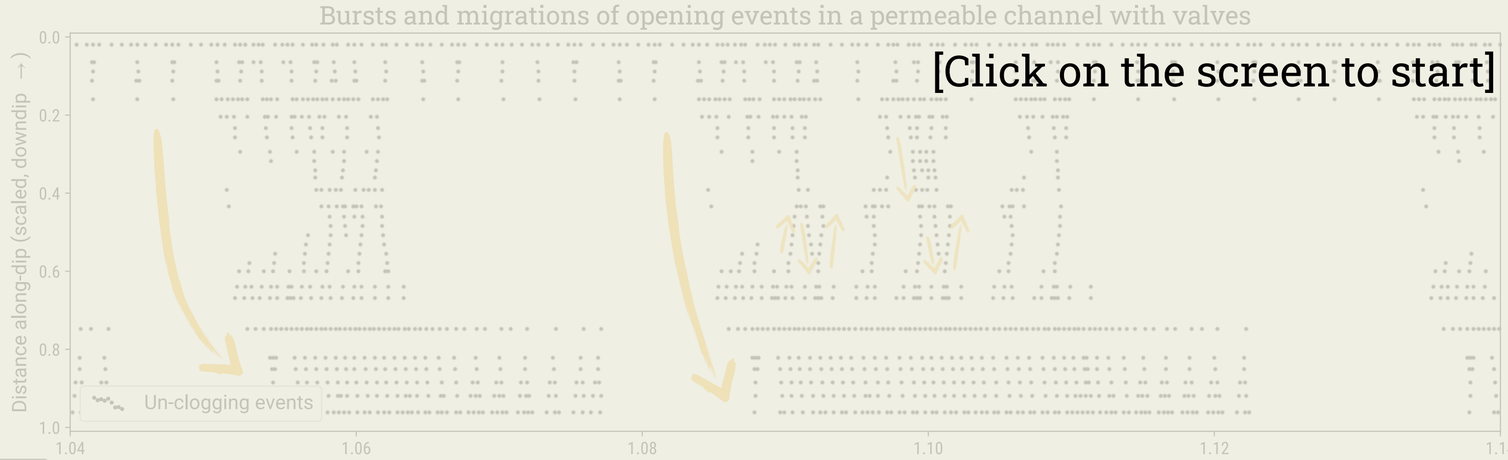
g

emerges from **cascades** and **interactions** of **un-clogging and clogging in permeable channels**



Background and motivation *[+]*

Variations of **fluid pressure** within subduction fault zones can **fuel fault-slip** events *[1]* and trigger the largest earthquakes *[2]*.

In active subduction zones, fluid flow can be tracked through the activity of tremor and low-frequency earthquake (LFE) it seems to trigger.

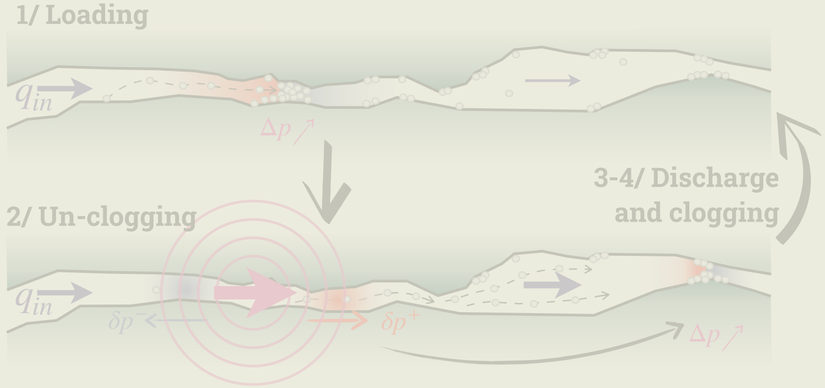
We build a model to **explore how fluid transport in a fault shapes its seismicity**.

Model design *[+]*

We solve for fluid pressure diffusion in a 1D, **dynamically permeable channel along-dip**.

Locally, several **permeability valves** open/close in response to the pressure gradient.

The strong, rapid pressure transient at **opening can act as** (or trigger) **a seismic source**.



Results *[+]*

As seismic sources **interact through rapid fluid pressure transients**, events occur in cascades. Activity is **clustered** and **migrates** in the channel. *[+]*

The input flux in the fault zone controls if activity occurs, and shapes its intermittence. *[+]*

Conclusions

This simple conceptual model shows how variable and realistic patterns of seismicity can be driven by dynamic permeability in a constantly fed fluid transport system.

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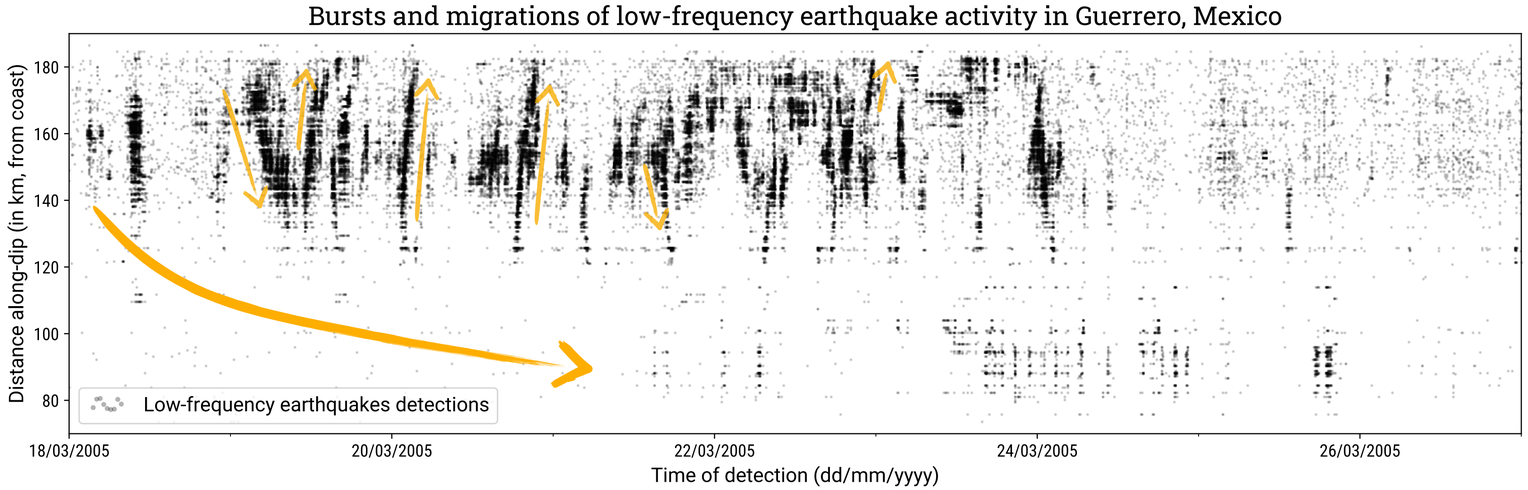

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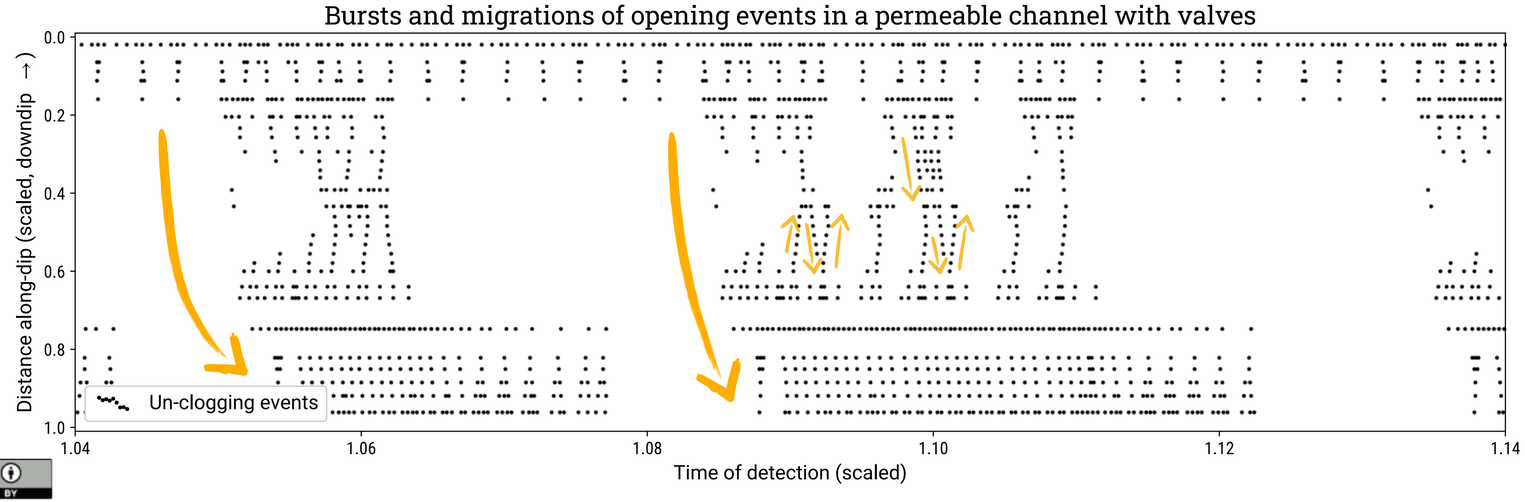

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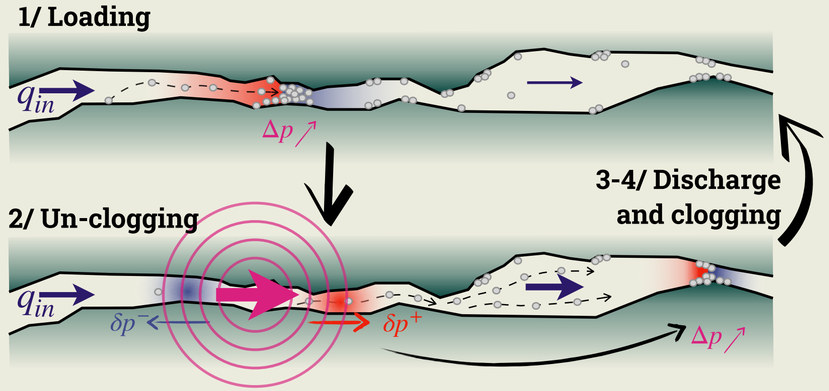

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