

# Helmstetter et al. (2003)

Mainshocks are aftershocks of conditional foreshocks: How do foreshock statistical properties emerge from aftershock laws

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# Outline



Introduction: Pre-slip vs cascade of foreshocks

### Two points of view



# Cascade model

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## Pre-slip model

Foreshocks are triggered by aseismic slip over an area surrounding the mainshock hypocentre.

### Consequences:

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The underlying aseismic slip might be a precursor to the earthquake.

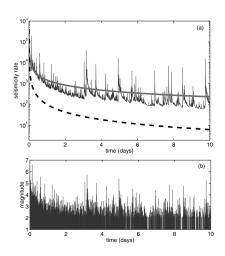
The foreshocks are no different than any other set of clustered earthquakes.

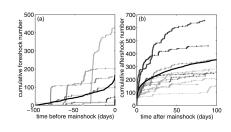
Foreshocks might occur by neighbour-

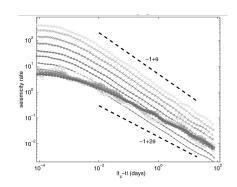
to-neighbour stress transfer between

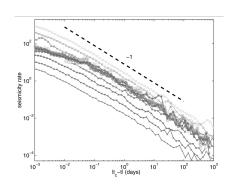
them without an aseismic slip compo-

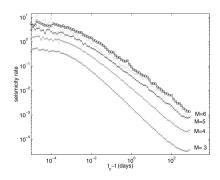
The mainshock is just a random outcome of triggering.

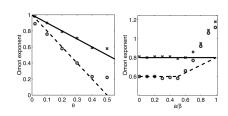


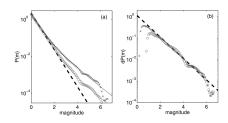


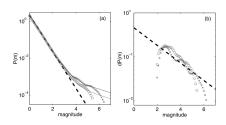


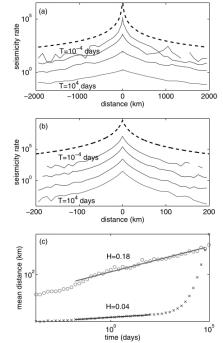












Earthquake precursors - Reading group

