

## Helmstetter et al. (2003)

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

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Introduction: Pre-slip vs cascade of foreshocks

### Pre-slip model

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

#### Consequences:

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

### Cascade model

Foreshocks might occur by neighbour-to-neighbour stress transfer between them without an aseismic slip component.

#### Consequences:

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

The mainshock is just a random outcome of triggering.





















