Detecting low-frequency earthquakes with deep learning

Jannes Münchmeyer

ISTerre
Institut des Sciences de la Terre

OSUG

The (a)seismic spectrum
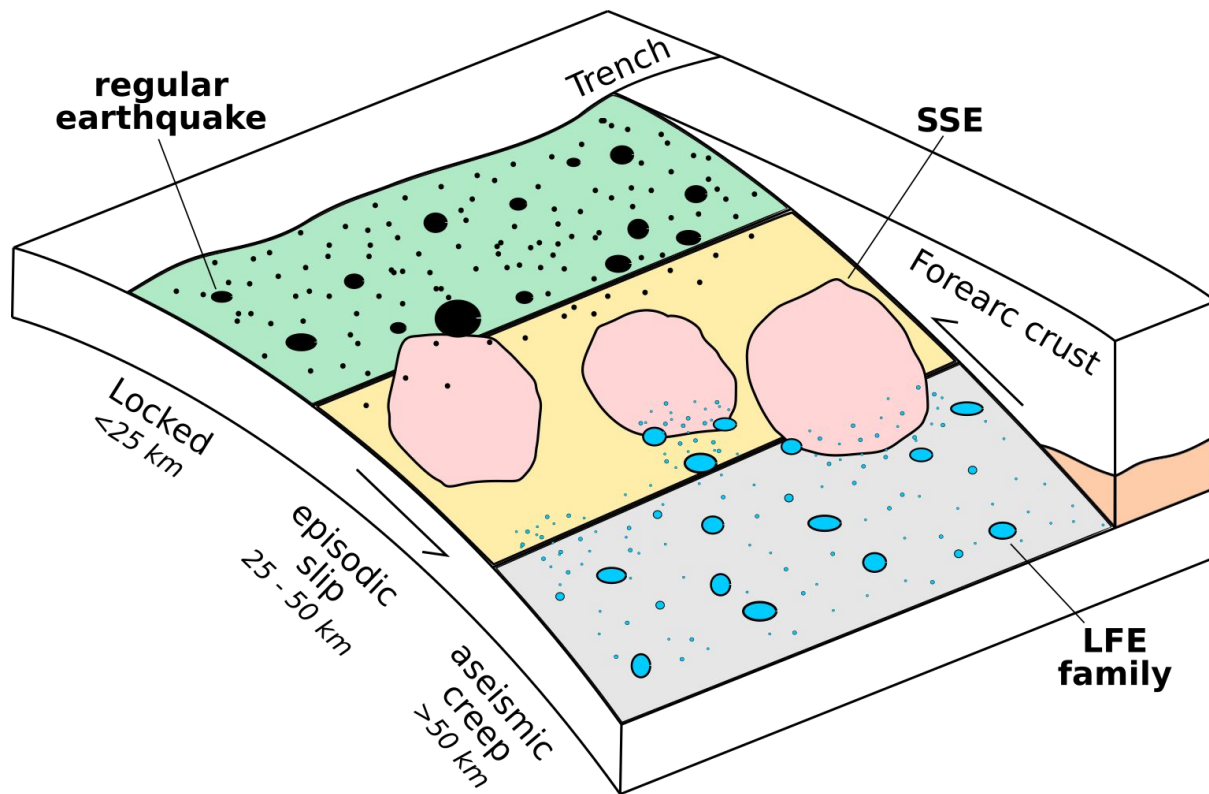
Detecting LFEs is difficult
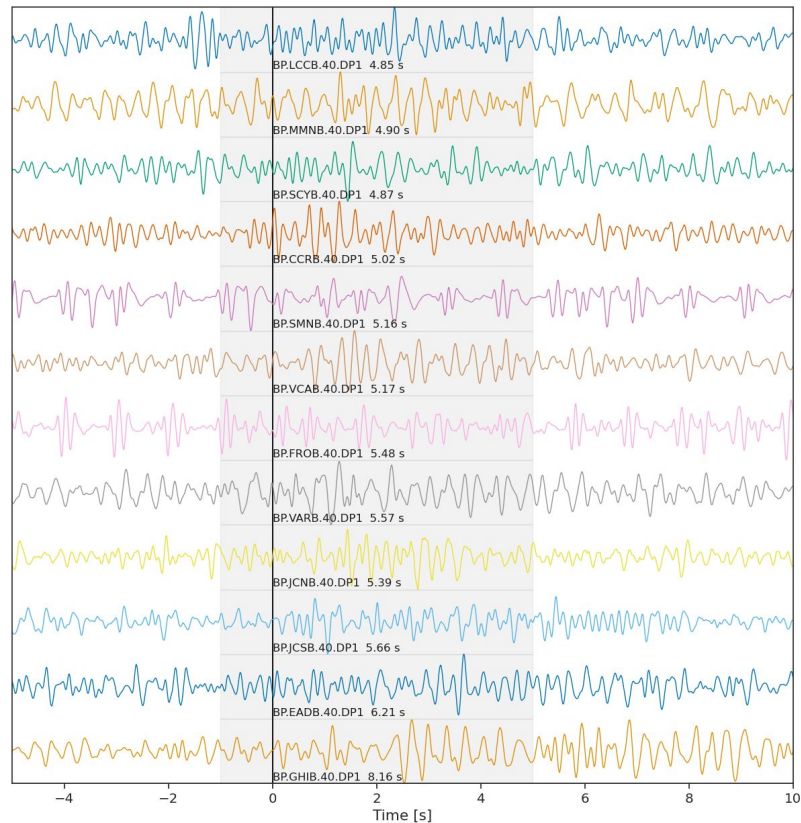
Earthquake detection with deep learning

Deep learning for LFE detection
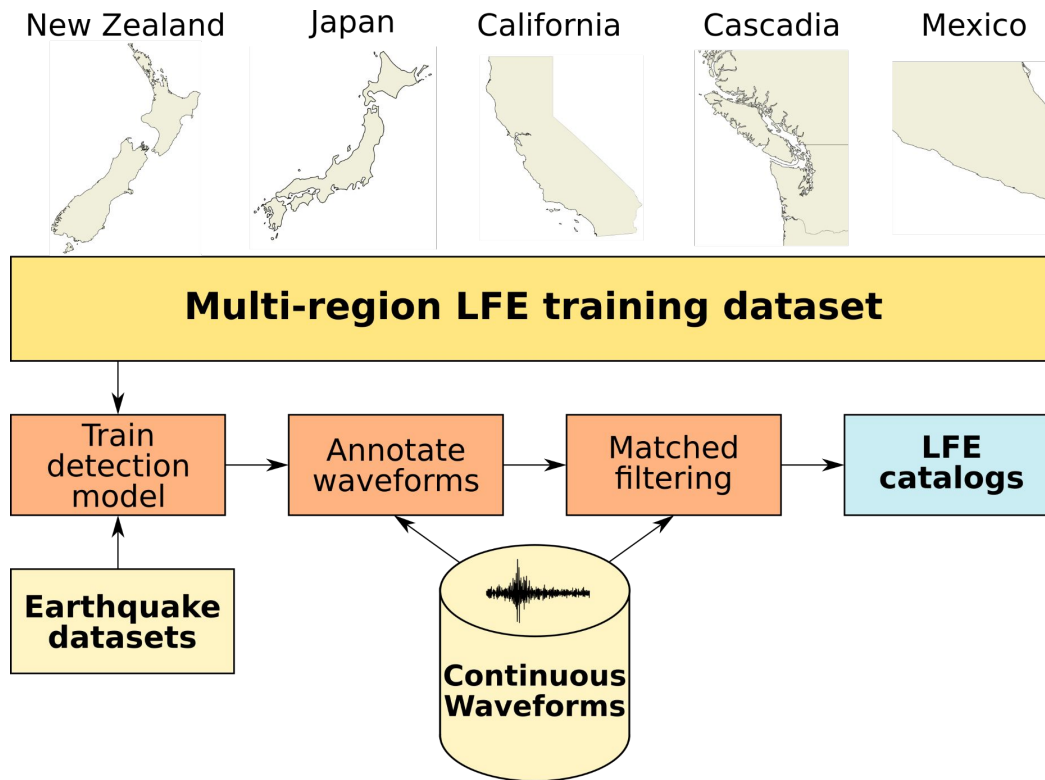
New Zealand   Japan   California   Cascadia   Mexico

Multi-region LFE training dataset

Train detection model

Annotate waveforms

Matched filtering

LFE catalogs

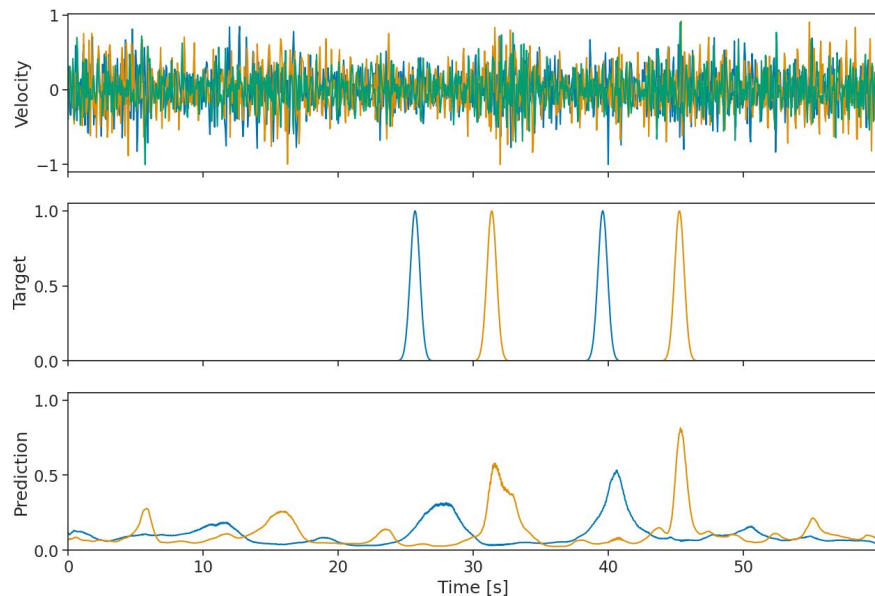**Earthquake datasets**
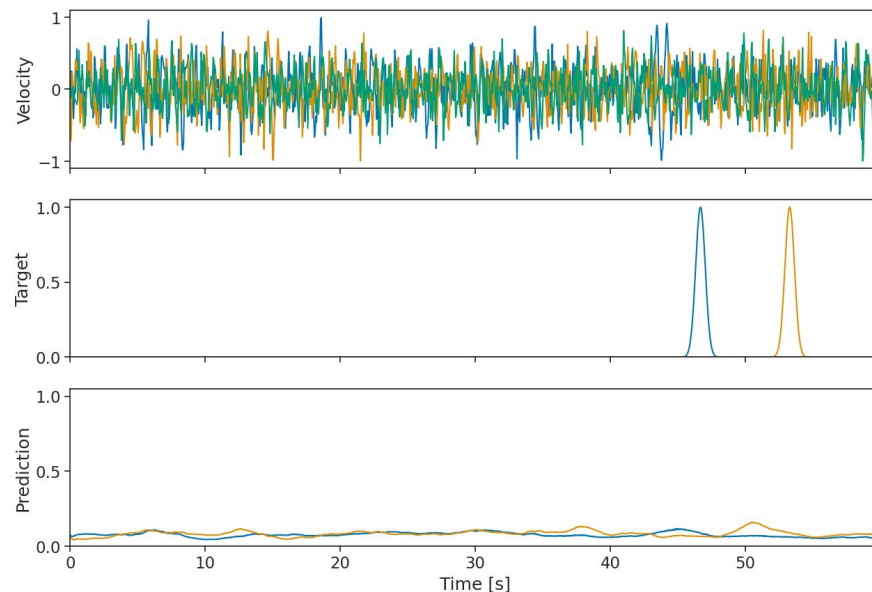
Continuous Waveforms
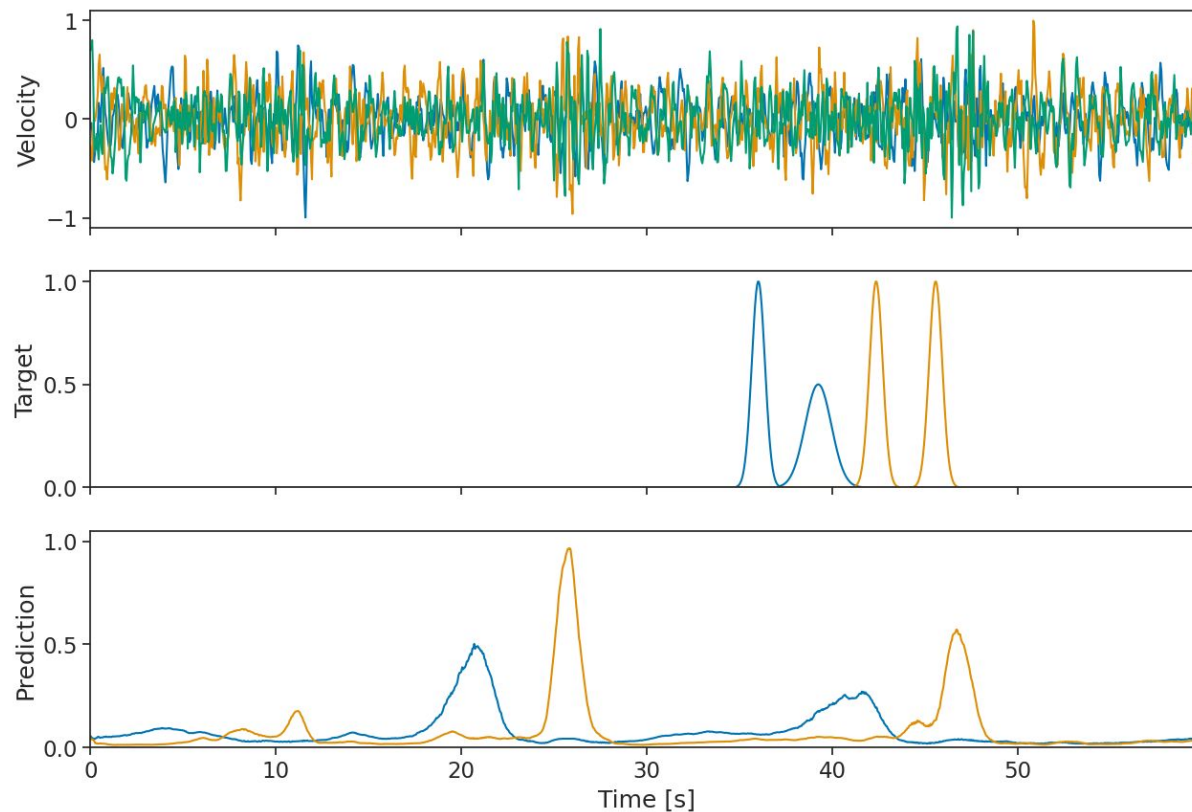
LFE training datasets

LFE detection curves …

… are sometimes good.

… but usually bad.

Uncataloged LFEs

Why is detecting LFE harder than EQs?

- Catalog quality
- Worse signal-to-noise ratio
- Dense spacing of events