A team from Kyoto University and Géoazur has developed a new approach, based on a deep learning AI for detecting *prompt elasto-gravity signals*, or PEGS. These are gravitational changes generated by large-mass motion in megaquakes and can be recorded by seismometers. Until now, however, the minute amplitude of PEGS has prevented their use for earthquake and tsunami alert systems.

The team was then able to demonstrate their deep-learning model's ability to instantaneously track an earthquake in real time after it reaches a certain size (Fig. 1 shows the performance of the algorithm on synthetic data). The event was sourced from actual Japanese seismic data after training the AI to process simulated waveforms (Fig. 2 shows the performance of the algorithm on historical data from the Tohoku-oki earthquake).

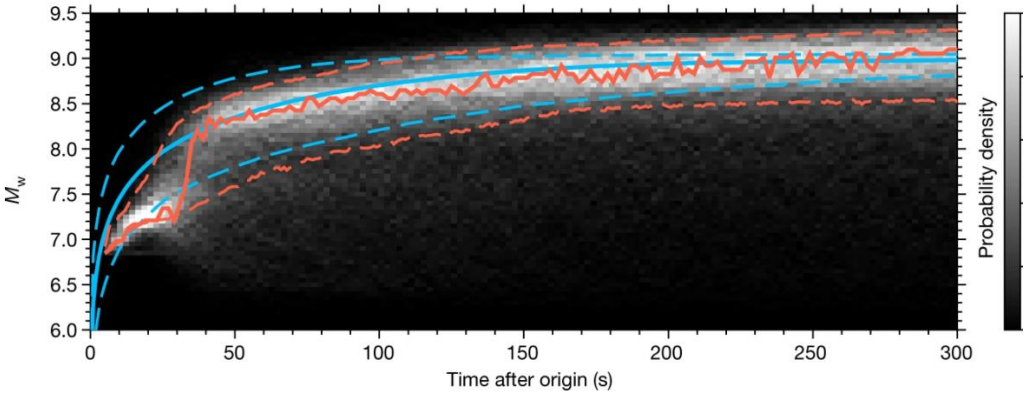

Fig. 1: *Performance of the algorithm at tracking earthquake magnitude over time, for a number of magnitude 9 earthquake scenarios.*

Although the algorithm still needs to be tested on live data, the scientists believe the results have the potential to improve earthquake and tsunami alert systems.

The research "Instantaneous tracking of earthquake growth with elastogravity signals" appeared on May 11, 2022 in *Nature*, with doi: 10.1038/s41586-022-04672-7, and will be presented at the CCEP meeting on February 28, 2023.

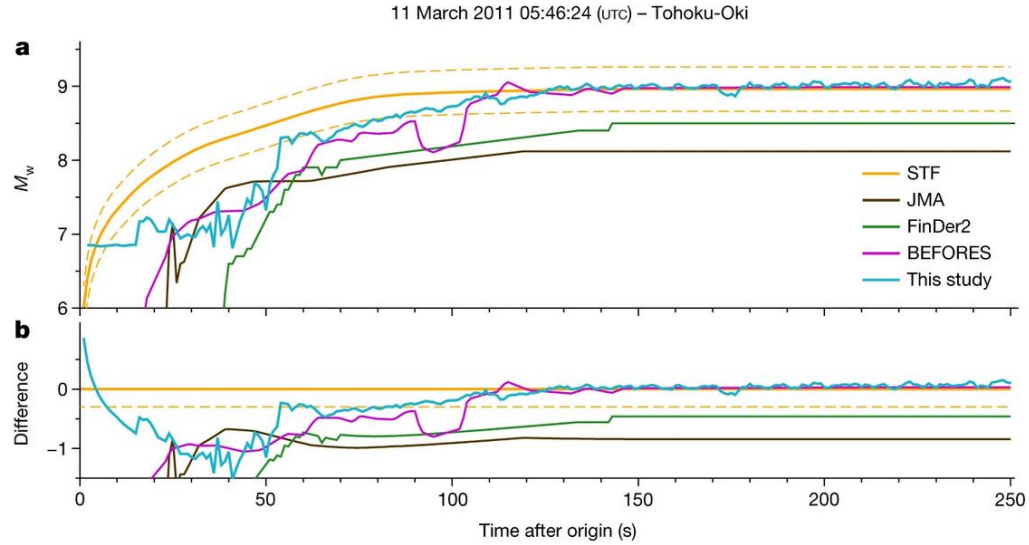

Fig. 2: *Performance of the algorithm at tracking the magnitude of the Tohoku-oki earthquake on historical data, compared with other EEW algorithms.*