

## Origins of the tsunami following the 2023 Turkey–Syria earthquake

\*Gui Hu<sup>1,2</sup>, Kenji Satake<sup>1</sup>, Linlin Li<sup>2</sup>, Peng Du<sup>2</sup>

1. Earthquake Research Institute, University of Tokyo, 2. School of Earth Sciences and Engineering, Sun Yat-sen University

On 6 February 2023, a local tsunami was recorded in the southeastern Mediterranean Sea following the Mw 7.8 Turkey–Syria inland strike-slip earthquake. Due to complexity of the earthquake source and lack of underwater observation, the physical mechanism of the tsunami generation remains mysterious. To understand the tsunami source mechanisms, we analyzed the tsunami waveforms recorded by four nearby tide gauges and located the possible sources using a backward tsunami ray tracing approach. We then conducted forward numerical modelings for a range of possible sources with parameters informed by both the periods and amplitudes of recorded tsunami waveforms. We show that there were probably two existing tsunami sources, inside the Iskenderun Bay and outside the Bay. The dominant period of the tsunami observed inside the Bay was 10–30 min with negative initial motion. It was generated by a source of 11 km in diameter with initial depression at the entrance of the Bay, where the large peak ground acceleration was recorded, hence probably generated by a landslide. Outside the Bay, tsunami mainly came with dominant periods of 2–20 min and positive initial motions. This was generated from an initial elevation of 6 km in diameter offshore the coast of Antakya, possibly related to liquefaction. The remarkably different wave properties and generation mechanisms raise our awareness of the underestimated tsunami hazards due to coastal strike-slip earthquakes.

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