



Characteristics of the October 2020 Mw 7.0 Aegean Sea earthquake from sea level data analysis and numerical modeling

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Introduction:

The 30 October 2020 Mw7.0 earthquake left 117 deaths in Turkey and two casualties in Greece. The associated tsunami caused one death in Turkey. The earthquake was of normal-faulting type; the region was struck by two other normal-faulting tsunamigenic earthquakes since June 2017. The tectonic reasons for the generation of these earthquakes can be attributed to the Hellenic subduction zone and the North Anatolian fault.

Data: Tide gauge data; published runup survey data.

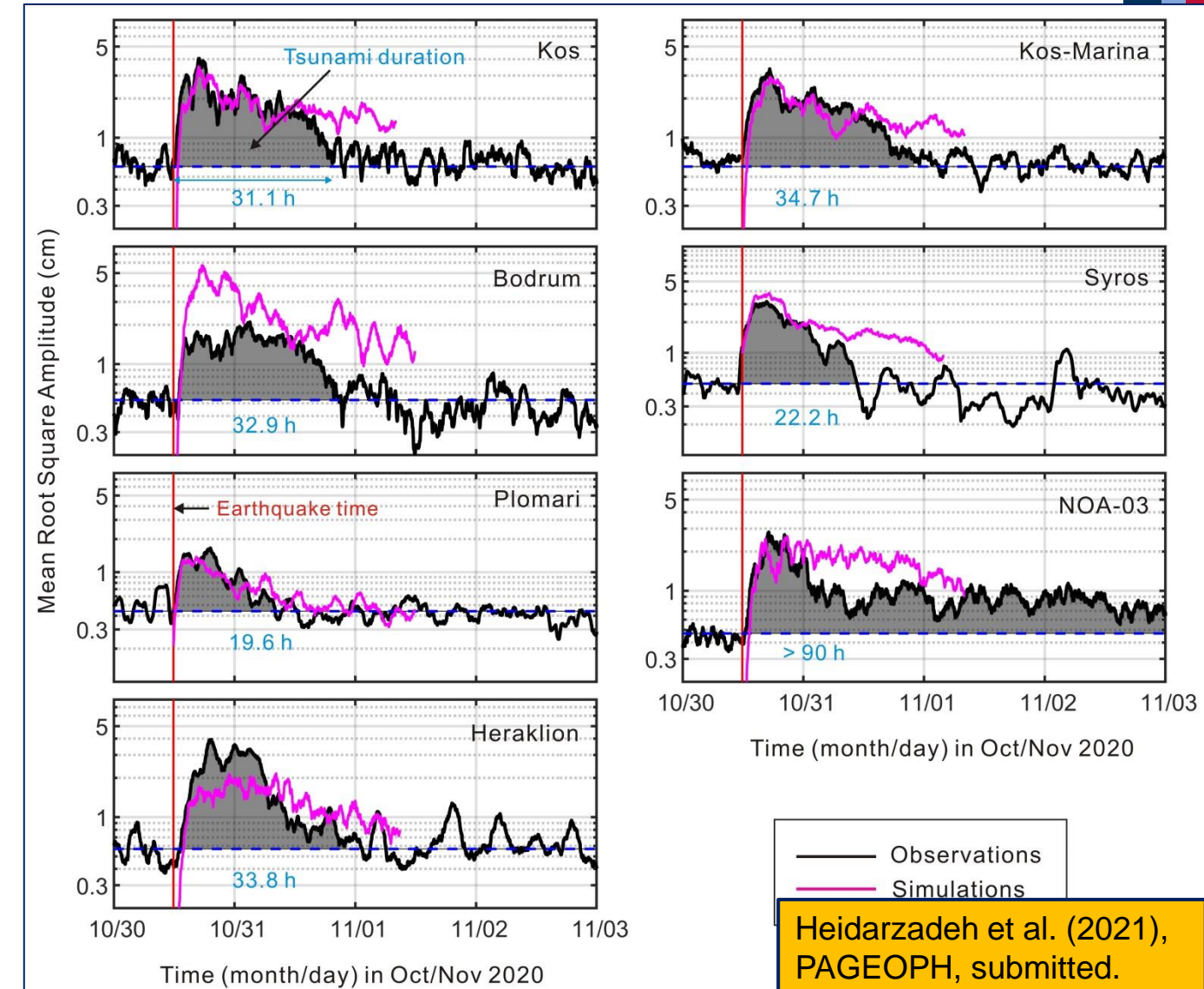
Methods: Tsunami waveform analyses; spectral analyses including Wavelet; and numerical simulations.

Characteristics of the Oct 2020 tsunami:

- Tsunami duration was from 20 hours to >90 hours based on the analysis of tide gauge data. This is unusual based on the data from other similar-size events worldwide.
- The maximum tsunami wave arrived very late compared to the first arrival time. The maximum waves arrived up to 15 h after the first tsunami arrivals. This is also unusual. For comparison, it is much longer that the values that we had for some stations during the 2011 Japan tsunami.
- Spectral analyses of the waves revealed multiple spectral peaks from 4.5 min to 23.3 min.

Initial analysis:

The long tsunami oscillations and multiple spectral peaks can be most likely attributed to the confined nature of the Aegean Sea and the fact that the area is home to numerous islands; any tsunami could trigger various oscillations.



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