

Supplementary Material for: Initial observations of 23 April 2025 Marmara Sea (M_w 6.3), Türkiye earthquake: aftershock, seismic source, and ground motion analysis

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1 V_{s30} Map of Marmara Region

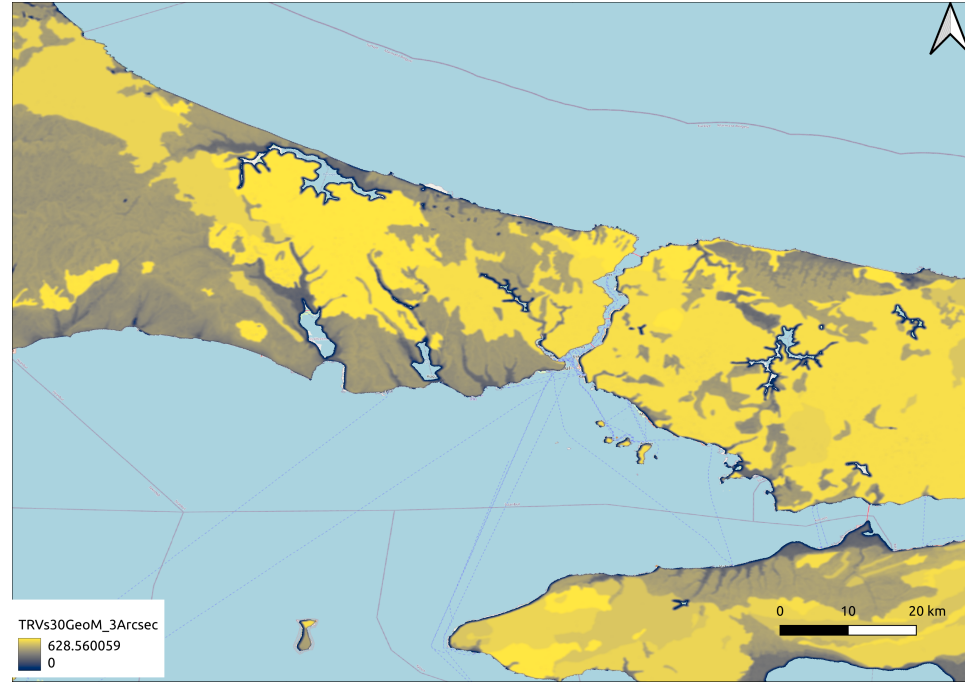


Figure S1: V_{s30} Map of the region determined by Okay and Ozacar (2024). Background map data by OpenStreetMap, under ODbL.

2 Residuals of GMPE Predictions

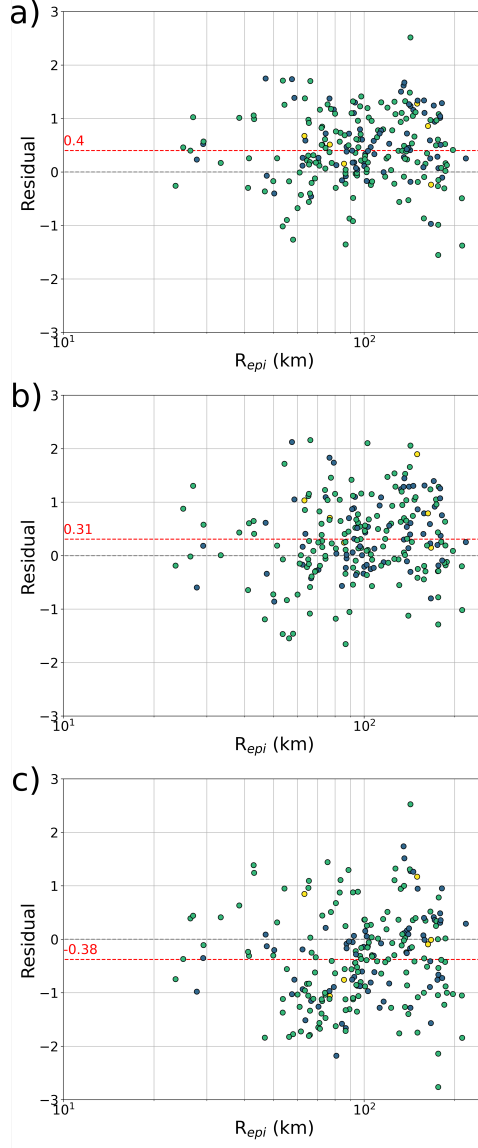


Figure S2: Residuals of the observed and predicted ground motions of PGA, PSA0.3s, and PSA1.0s by using the GMPE developed by Kale et al. (2015). Red dashed line represents the average of the residuals. Soil information is retrieved from Disaster and Emergency Management Authority (AFAD, 1973) station database if available, otherwise estimated from the study of Okay and Ozacar (2024).

References

Okay, H. B. and Özacar, A. A. A Novel VS 30 Prediction Strategy Taking Fluid Saturation into Account and a New VS 30 Model of Türkiye. *Bulletin of the Seismological Society of America*, 114(2):1048–1065, 2024. doi: <https://doi.org/10.1785/0120230032>.

Kale, Ö., Akkar, S., Ansari, A., and Hamzehloo, H. A ground-motion predictive model for Iran and Turkey for horizontal PGA, PGV, and 5% damped response spectrum: Investigation of possible regional effects. *Bulletin of the Seismological Society*

of America, 105(2A):963–980, 3332015. doi: <https://doi.org/10.1785/0120140134>.

Disaster and Emergency Management Authority. Turkish National Strong Motion Network, 1973. <https://www.fdsn.org/networks/detail/TK/>. doi: 10.7914/SN/TK.