

UNZIP EARTHQUAKE PROPAGATION FROM NEAR-FAULT RUPTURE PHASES OF THE 2023 KAHRAMANMARAŞ, TÜRKIYE MW 7.8 EARTHQUAKE

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Understanding and deciphering wiggles from seismograms has been a long endeavor to understand the internal structure of the Earth and to explore earthquake source properties (e.g., Mohorovičić, 1910; Lehmann, 1936). Here we make the first attempt to decipher the continuous rupture phases as large near-fault velocity pulses along the East Anatolian Fault in the 2023 Mw 7.8 Kahramanmaraş, Türkiye earthquake. Through data analysis and dynamic rupture simulations, we illustrate impacts of fault-normal distance and fault geometry on near-fault velocity pulses. The identified fault-parallel velocity pulses associated with the rupture front suggest a transient supershear along the Amanos segment and rupture deceleration at fault bends. Our study highlights the complexity and superior application of near-fault data in studying earthquake source dynamics.

