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Listening to Anticracks in Laboratory Earthquakes under the True Triaxial 3D Remote Stress Field H.O. GHAFFARI, M.H.B. NASSERI, R. PAUL YOUNG, University of Toronto — A real deformation in the earth produces 3D stress as well as displacements on polymodal fault sets. Here we present the results of the multi-stationary acoustic waveforms from the orthorhombic faulting patterns in sandstone under 3D-polyaxial stress fields. Based on the analysis of over 104 rupture fronts and using the functional acoustic network theory, we show that generally waveforms from true triaxial tests carry shorter rapid slip phase (8-10 μs), implying the controlling role of the intermediate remote-stress field on mesoscopic faulting which is explained with inducing irregular micro-cracking. Furthermore, we extract failure criterion in network's phase space per each occurred failure of heterogeneity/asperity, confirming the macroscale failure measures in true triaxial tests. Our results suggest that boundary conditions can drastically change the regime of ruptures in laboratory earthquakes by inducing a sort of anti-crack like ruptures.

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