

Abstract Submitted
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Charge-density waves competitions in 1T-TaS₂ and ErTe₃ investigated by femtosecond electron crystallography¹ FARAN ZHOU, TZONG-RU HAN, ZHENSHENG TAO, JENNI PORTMAN, DAT DO, SUBHENDRA MAHANTI, PHILLIP DUXBURY, CHONG-YU RUAN, Michigan State University, CHRISTOS MALLIAKAS, MERCOURI KANATZIDIS, Northwestern University, CHONG-YU RUAN GROUP TEAM, DUXBURY-MAHANTI GROUP COLLABORATION, KANATZIDIS GROUP COLLABORATION — Competitions between different lattice- and charge-ordered states in two-dimensional materials can lead to strongly first order phase transitions. In 1T-TaS₂, the phase transitions are primarily driven by strong electron correlations and Fermi surface nesting, but between the Mott insulating ground state and the high-temperature incommensurate charge-density wave (CDW) there exists a near-commensurate phase characterized by unique domain structures, where their long-range coherence and pseudo-gap property are currently under debates. Using femtosecond electron crystallography, we resolved the domain proliferation dynamics and the distinctly different characters of electronic phase transitions and CDW restructuring. We also compare our results with the CDW competitions in the weakly correlated system ErTe₃.

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