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Photoinduced Dynamics of Charge Density Waves in Mott-Peierls Systems YAO WANG, Stanford University/ Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory, CHENG-CHIEN CHEN, Advanced Photon Source, Argonne National Laboratory, CHUNJING JIA, Stanford University/ Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory, MICHEL VAN VEENENDAAL, Advanced Photon Source, Argonne National Laboratory/Department of Physics, Northern Illinois University, THOMAS DEVEREAUX, Stanford University/ Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory, BRIAN MORITZ, Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory — Studying non-equilibrium dynamics can potentially enhance our understanding of the physics underlying competing orders in strongly correlated systems. To characterize charge-ordered systems in time-resolved pump-probe experiments, we examine the photoinduced dynamics of charge and spin density waves in one-dimensional Mott-Peierls systems, by exact diagonalization and Krylov time-evolution techniques. We observe anti-phase dynamics at the renormalized phonon frequency and a coupling-strength-dependent suppression/enhancement of CDW/SDW orders, reflecting the competing-order-driven phase transition. Our study offers an approach to analyze and classify competing or coexisting orders in strong correlated systems through non-equilibrium dynamics.

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