

Abstract Submitted
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Charge Density Wave Pinning Dynamics in TaS₂¹ J.-D. SU, Argonne National Laboratory, Argonne, IL 60439, USA, J. MOHANTY, University of California, San Diego, La Jolla, CA 92093, USA, A. R. SANDY, Argonne National Laboratory, Argonne, IL 60439, USA, O. G. SHPYRKO, University of California, San Diego, La Jolla, CA 92093, USA, M. SUTTON, McGill University, Montreal, Quebec, Canada, H3A 2T8 — Using x-ray photon correlation spectroscopy, we study the dynamic properties of charge density waves (CDWs) in pure and doped 1T-TaS₂. Using coherent x-ray diffraction, speckles are observed in the first-order impurity-broadened CDW satellite peak. Time dependence of the speckle pattern is observed after a temperature jump (typically 10K). Surprisingly, the speckle pattern displays non-equilibrium relaxation behavior with a characteristic timescale progressively growing with increasing time after the temperature change. We describe a model in which the slow dynamics is associated with rearrangements of the CDW phase under the influence of the randomly distributed pinning sites. We compare our results to descriptions provided by transport and thermodynamic measurements.

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