

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Electron and ion dynamics in the melting of two-dimensional charge density waves¹ TZONG-RU HAN, Michigan State University, CHRISTOS MALLIAKAS, Northwestern University, S.D. MAHANTI, Michigan State University, MERCOURI KANATZIDIS, Northwestern University, CHONG-YU RUAN, Michigan State University — The cause of local lattice distortion in the formation of charge density waves (CDW) in 1D materials is often attributed to the Peierls mechanism, while for 2D system, such as CeTe₃, it is not precisely known, due to imperfect nesting of the Fermi surface and a rather large CDW gap observed. Using ultrafast electron crystallography, the femtosecond electronic melting and recrystallization of CDW is investigated by following the superlattice peaks (order parameter) originated from the long-range charge ordering and the accompanying lattice distortion. We find that the reconstitution of CDW is subject to a bottleneck effect that can be attributed to the distinctively separated dynamical properties of electrons and ions in the short time scale, revealing the complexity of 2D CDW formation.

¹This work is supported by DOE under DE-FG02-06ER46309 and NSF under NSF-DMR 0703940.

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Date submitted: 19 Nov 2010

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