

Abstract Submitted  
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**Two-dimensional dynamical reconstruction of the valence exciton in LiF**<sup>1</sup> XIAOQIAN M. CHEN, YU GAN, PETER ABBAMONTE, University of Illinois at Urbana-Champaign, CHEN-LIN YEH, Tamkang University, Taiwan, DIEGO M. CASA, Argonne National Laboratory, WEI KU, Brookhaven National Laboratory — The structure and dynamics of excitons are interesting because excitons are model many-body excitations with technological relevance, e.g. to the behavior of photocells. In a previous study, we used inelastic X-ray scattering, together with inversion techniques, to reconstruct one-dimensional projection images of exciton propagation in LiF in real space and time, and showed that the exciton in LiF is of the Frenkel type. Here we generalize our previous work to a two dimensional plane in LiF. Our new images of exciton propagation show intricate shape changes arising from scattering off of the crystal lattice. Our results are compared to model Wannier function calculations for a more detailed test of the Frenkel model.

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