Max-Planck-Institut für Struktur und Dynamik der Materie

Max Planck Institute for the Structure and Dynamics of Matter

Wednesday, June 15th 2016 – 11:00
CFEL Seminar room IV (Blgd. 99)

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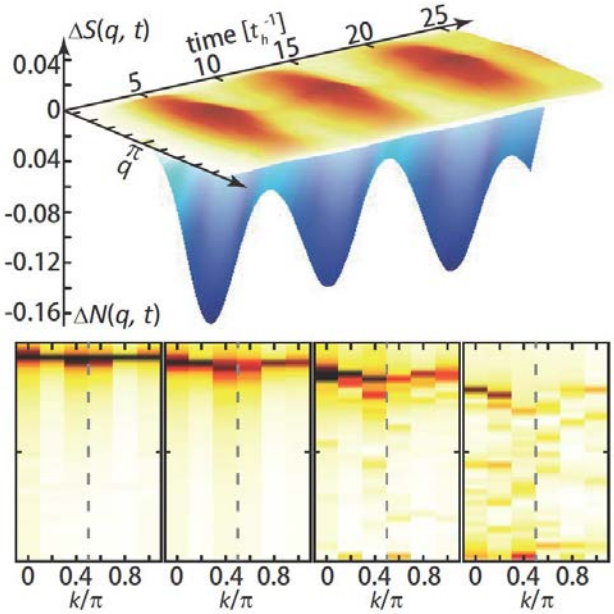
Nonequilibrium Study of Competing Orders

Competition between ordered phases, and their associated phase transitions, are significant in the study of strongly correlated systems. Here, we examine one aspect, the nonequilibrium dynamics of a photoexcited Mott-Peierls system, using an effective Peierls-Hubbard model and exact diagonalization. Near a transition where spin and charge become strongly intertwined, we observe antiphase dynamics and a coupling-strength-dependent suppression or enhancement in the static structure factors. The renormalized bosonic excitations coupled to a particular photoexcited electron can be extracted, which provides an approach for characterizing the underlying bosonic modes. The results from this analysis for different electronic momenta show an uneven softening due to a stronger coupling near k_F. This behavior reflects the strong link between the fermionic momenta, the coupling vertices, and ultimately, the bosonic susceptibilities when multiple phases compete for the ground state of the system.



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