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Real Space Visualization of Mott Gap and Magnon Excitations
YAO WANG, CHUNJING JIA, Department of Applied Physics, Stanford University, BRIAN MORITZ, THOMAS DEVEREAUX, SLAC National Accelerator Laboratory, Stanford Institute for Materials and Energy Sciences — Real-space and time information plays a significant role in understanding inhomogeneous physical and chemical processes at the nano-scale. Experimentally, inelastic light scattering promises to become an important tool for characterizing the spatio-temporal properties of complex systems. To demonstrate the power of this technique, we perform a theoretical study of real-space charge and spin density response functions in the Hubbard model to track time-dependent Mott gap and magnon excitations. Carrier doping is found to affect the evolution of the charge and spin response with distinct timescales and real-space patterns appearing for n- or p-type materials.

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