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Photodynamics of optical excitations in one-dimensional models for organic salts. JULIAN RINCON, Perimeter Institute for Theoretical Physics, KHALED AL-HASSANIEH, Oak Ridge National Laboratory, ADRIAN FEIGUIN, Northeastern University , ELBIO DAGOTTO, Oak Ridge National Laboratory and University of Tennessee — We study the time-dependent evolution of photogenerated optical excitations in a model for organic salts, using the density matrix renormalization group method. The model consists of the quarter-filled one-dimensional extended Peierls-Hubbard Hamiltonian interacting with a classical time-dependent electric field. Our main results show that the overall dynamics of the dominating $4k_F$ bond and charge instabilities corresponds to a gigantic fluctuating behavior as a function of time, whereas the $2k_F$ state remains largely unaffected. These results remain valid regardless of the nature of the optical excitations and whether the system is driven resonantly or not. We compare our calculations with experimental pump-and-probe ultrafast spectroscopy studies of the optical conductivity in organic compounds.

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