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**Phonon Dynamics and Correlation Induced Tunneling of Few-Body Dipolar Bosons in Multiwell Potentials** LUSHUAI CAO, XIANGGUO YIN, PETER SCHMELCHER, Zentrum fuer Optische Quantentechnologien, Hamburg University, Germany — We numerically investigate the dynamics of few-body dipolar bosonic ensembles in multiwell potentials. Initially the dipolar bosons are prepared in supersolid-like states, with long-range density order and spatial correlations among different sites. A local perturbation is then applied to a single boson, which brings the boson out of equilibrium. We focus on the effect of the non-local dipolar interaction, as well as the site-selected spatial correlation in the initial state to the dynamics. We obtain that firstly, the non-local interaction spread the local perturbation to the whole lattice, and phonon-like collective dynamics arises. Secondly, the site-selected spatial correlation also induces the correlation-induced tunneling (CIT). Moreover the coupling between the phonon dynamics and CIT is also observed. The investigation is based on the numerically exact ML-MCTDHB method, and the results are beyond mean-field approximations and the single-band Bose-Hubbard model.

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