

Adiabatic Preparation of a Correlated Symmetry-Broken Initial State with the Generalized Kadanoff-Baym Ansatz

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A time propagation method based on the generalized Kadanoff-Baym Ansatz (GKBA) [1] is applied to a lattice system with a symmetry-broken equilibrium phase, namely an excitonic insulator [2]. The adiabatic preparation of a correlated symmetry-broken initial state is assessed by comparing with a solution of the imaginary-time Dyson equation. We find that it is possible to reach a symmetry-broken correlated initial state with nonzero excitonic order parameter by the adiabatic switching procedure. We discuss under which circumstances this is possible in practice within reasonably short switching times [3]. We further investigate the out-of-equilibrium dynamics of competing orders and how the balance between them could be controlled by laser driving [4].

[1] P. Lipavský et al., Phys. Rev. B 34, 6933 (1986)

[2] D. Golez et al., Phys. Rev. B 94, 035121 (2016)

[3] R. Tuovinen et al., Phys. Status Solidi B. doi:10.1002/pssb.201800469 (2018)

[4] R. Tuovinen et al., in preparation.