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Lattice field theory of organic semiconductors

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Organic semiconductors such as rubrene or pentacene feature an unconventional charge transport mechanism that is entirely driven by dynamical disorder created by thermal bath of soft phonons, and that is very nontrivial to simulate from first principles. We report on Hybrid Monte-Carlo simulations of charge transport in organic semiconductors, and discuss physical similarities with finite-temperature QCD. In particular, we introduce reduced-variance observables for current-current correlators and the corresponding spectral functions which might also be useful in lattice QCD at finite temperature.

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