Contribution to "Numerical and analytical methods for strongly correlated systems"

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- Title: Lieb-Robinson bounds for spin-boson lattice models and trapped ions
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- Abstract: We derive a Lieb-Robinson bound for the propagation of spin correlations in a model of spins interacting through a bosonic lattice field, which satisfies itself a Lieb-Robinson bound in the absence of spin-boson couplings. We apply these bounds to a system of trapped ions, and find that the propagation of spin correlations, as mediated by the phonons of the ion crystal, can be faster than the regimes currently explored in experiments. We propose a scheme to test the bounds by measuring retarded correlation functions via the crystal fluorescence.
- Bibliography: Phys. Rev. Lett. 111, 230404 (2013)