Dynamics of Noisy Quantum Systems in the Heisenberg Picture: Application to the Stability of Fractional Charge[1] ARMIN RAHMANI, University of British Columbia — Based on the Heisenberg-picture analog of the master equation, we develop a method for computing the exact time dependence of noise-averaged observables for (generally interacting) fermionic systems with noisy hopping processes. Our results provide access to a long-time limit, which is not amenable to numerical simulations. As a simple example, we examine the fate of the fractional charge in a noisy dimerized lattice with a domain wall (relevant to cold-atom emulations of polyacetylene). We find that the fractional charge remains robust against noisy hopping processes between different sublattices, while it becomes unstable to fluctuations in hopping on the same sublattice.

Armin Rahmani
University of British Columbia