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Fock-Space Coherence in Quantum Dots EDUARDO VAZ, JORDAN KYRIAKIDIS, Dalhousie University — We investigate the non-Markovian time evolution of the Fock-space coherence between states with different particle numbers in a multilevel quantum dot. By analyzing the off diagonal density matrix elements for a model where the dominant relaxation mechanism is through sequential tunneling transport, we observe a decoupling between the evolution of the Fock-space coherence and that of the population probabilities for the dot states. When tunneling rates to distinct orbitals differ — a common occurrence — the decoherence time of the Fock-space elements of the density matrix can be dramatically increased even when the Hilbert-space coherence between states with same particle number decreases. This is an example of how a many-body coherence can remain robust even in the presence of rather large single-particle noise.

Eduardo Vaz
Dalhousie University

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