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**Schwinger-Keldysh Formalism for Non-Hermitian Quantum Problems: A Case Study on Non-Equilibrium Steady State Transport**

PAATA KAKASHVILI, C.J. BOLECH, Physics and Astronomy Department, Rice University, Houston, TX 77005, USA — Non-unitary quantum mechanics has been used in the past to study irreversibility, dissipation and decay in a variety of physical systems. In this presentation, we propose a general scheme to deal with systems governed by non-Hermitian Hamiltonians. We argue that the Schwinger-Keldysh formalism gives a natural description for those problems. To be concrete, we study a simple model inspired by mesoscopic physics –an asymmetric junction (relevant to spin-valve devices). The system is governed by a non-Hermitian Hamiltonian which captures essential aspects of irreversibility. Calculated steady state transport properties show behavior which is anticipated on physical grounds.

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