

CMP Seminar

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Distinguishing between Quantum and Classical Markovian Dephasing Dissipation

Understanding whether dissipation in an open quantum system is truly quantum is a question of both fundamental and practical interest. We consider n qubits subject to correlated Markovian dephasing and present a sufficient condition for when bath-induced dissipation can generate system entanglement and hence must be considered quantum. Surprisingly, we find that the presence or absence of time-reversal symmetry plays a crucial role: broken time-reversal symmetry is required for dissipative entanglement generation. Further, simply having nonzero bath susceptibilities is not enough for the dissipation to be quantum. We also present an explicit experimental protocol for identifying truly quantum dephasing dissipation and lay the groundwork for studying more complex dissipative systems and finding optimal noise mitigating strategies.

Monday, April 25th, 2022, at 4:10 p.m.

Host: Mohammad Maghrebi