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No-go Theorem for Environment-assisted Invariance Symmetry of Entanglement

Tuesday, January 13, 2026 4:45 PM (30 minutes)

In this talk, I will examine the conditions under which quantum operations preserve environment-assisted invariance (envariance), a symmetry of entanglement. While envariance has traditionally been studied in the context of local unitary operations, I extend the analysis to include non-unitary local operations. I will show that, to maintain envariance, such operations must admit Kraus representations with a direct-sum structure, thereby effectively defining decoherence-free subspaces. Finally, I will discuss the broader implications of our main no-go theorem for quantum control.
Reference: A. Sone, A. Touil, K. Maeda, P. Cappellaro and S. Deffner, New J. Phys. 27 064509 (2025)

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