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Non-equilibrium Thermometry in The Strong Coupling Regime With Bosonic Sample and Probe

We characterize the measurement sensitivity, quantified by the Quantum Fisher Information (QFI), of a thermometric probe of quantum harmonic oscillator (QHO) strongly coupled to the sample of interest, a bosonic bath at temperature T. For non-equilibrium protocols, in which the probe is measured before reaching equilibrium with the sample, new behavior of the measurement sensitivity arising due to non-Markovian dynamics is expected, as in the fermionic case [arXiv:2310:14655]. We investigate whether QFI rate is maximized at a finite interrogation time t* as in the fermionic case.

Theme

Theme 3. Theoretical and experimental methods for quantum effects in energy processes

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