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[415] The Wave-Particle Duality in Quantum Heat Engine

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According to the wave-particle duality (WPD), quantum systems show both particle- and wave-like behavior, and cannot be described using only one of these classical concepts. The WPD implies that comparison to *one* classical model is generally insufficient; one wave and one particle model should be considered. We exploit this insight, contrasting a bosonic quantum heat engine with particle and wave counterparts. While both classical models reproduce the average output power of the quantum engine, neither reproduces its fluctuations. We find regimes where wave and particle descriptions agree with the quantum, and a regime where neither classical model is adequate, revealing the role of the WPD in non-equilibrium bosonic transport.

Theoretical Work

Theory

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