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Universal relations for dilute systems with two-body decays

Tuesday, 24 September 2024 14:00 (30 minutes)

In interacting many-body systems with chemical reactions, a key question is about how two-body decay depends on quantum correlations in interacting many-body systems. Here, we present a number of universal relations that directly connect two-body losses to other physical observables, including the momentum distribution and density correlation functions. These relations, which are valid for arbitrary microscopic parameters, such as the particle number, the temperature, and the interaction strength, unfold the critical role of contacts, a fundamental quantity of dilute quantum systems, in determining the reaction rate of quantum reactive particles in a many-body environment. Generalizations to reduced dimensions will also be discussed.

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