

Effects of Dissipation in the Anisotropic Dicke Model

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We investigate the effects of dissipation on the anisotropic Dicke model, where a collective spin ensemble interacts with a photon. In real-world quantum systems, unavoidable interactions with the environment introduce photon decay and spin relaxation, leading to energy loss. This dissipation can significantly impact the hallmark of normal-to-superradiant phase transition of the Dicke model. Our study aims to explore how dissipative couplings modify the system's phase transition and whether the dynamics retain characteristics of superradiance despite energy loss. Understanding these effects is crucial for applications in open quantum systems, quantum optics, and non-equilibrium phase transitions.
