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Wave Mechanics for Dissipative Classical Systems

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Dissipative systems are among the most interesting and challenging systems to study in physics. For instance, they require non-standard (i.e. complex) Lagrangians which include velocity-dependent potentials coupling the system of interest to another system (i.e. the environment). That is, a dissipative system can be thought of as a system that is coupled to another system. As such, studying this kind of system can only be complete if both (coupled) system units are studied together. This paper considered such a dissipative system and demonstrated a derivation of a wave equation governing its dynamics. Comparing the resulting wave equation to Schroedinger's wave equation proved Schrodinger's wave equation as a special case of the derived wave equation. A classical RLC circuit was modeled and analyzed within the framework of the derived wave equation and the resulting measurement loading was compared (at least conceptually) to the quantum measurement back-action. The paper then drew some inferences and speculated on the possibility of a quantum particle being interpreted as a dissipative particle coupled to its image (i.e. identical partner) particle in the dual space; that is, more like a self-interacting particle.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

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