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Title: Towards a Completion of Quantum Mechanics

Abstract:

To cast Quantum Mechanics - incomplete in its text-book version - in a final form, we have to understand how to derive the stochastic dynamics of individual isolated open systems from fundamental physical principles at the core of the so-called ETH-Approach to Quantum Mechanics. It is shown how, in the non-relativistic limit (with the velocity of light tending to infinity), this problem can be solved for simple systems of charged matter interacting with the quantized electromagnetic field. It turns out that the masslessness of photons plays a key role in this endeavor.