

Abstract Submitted
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Quantum evaporation of flavor-mixed particles¹ MIKHAIL V. MEDVEDEV, U. Kansas — Particles whose propagation (mass) and interaction (flavor) bases are misaligned are mixed, e.g., neutrinos, quarks, Kaons, etc. We show that interactions (elastic scattering) of individual mass-eigenstates can result in their inter-conversions. Most intriguing and counter-intuitive implication of this process is a new process, which we refer to as the “quantum evaporation.” Consider a mixed particle trapped in a gravitational potential. If such a particle scatters off something (e.g., from another mixed particle) elastically from time to time, this particle (or both particles, respectively) can eventually escape to infinity with no extra energy supplied. That is as if a “flavor-mixed satellite” hauled along a bumpy road puts itself in space without a rocket, fuel, etc. Of course, the process at hand is entirely quantum and has no counterpart in classical mechanics. It also has nothing to do with tunneling or other known processes. We discuss some implications to the dark matter physics, cosmology and cosmic neutrino background.

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Mikhail V. Medvedev
U. Kansas

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