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Axion Cavity at Quantum Level

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We show that at the quantum level the single axion-photon conversion rate is enhanced by the cavity quality factor Q, and quantitatively larger than the classical result by a factor $\pi/2$. Thus, the axion cavity can be considered as a quantum device emitting single-photons with temporal separations. This differs from the classical picture in which axions transition in batches and the converted energy accumulates in the electromagnetic field inside the cavity.

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