

Coherence amplification using atoms (ions) for fundamental physics

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“Coherent phenomena have potential applications in fundamental physics. We have proposed neutrino mass spectroscopy using atomic targets, by utilizing the “coherence-amplification” of the weak neutrino-emission process. I will mainly report on recent activity on coherence-related proposals and experiments using the doped ion in crystals [1,2], and some related topics.

[1] H. Hara, J. Han et al. “Periodic superradiance in an Er:YSO crystal”, Phys. Rev. Res. 6, 013005 (2024).

[2] H. Hara, A. Yoshimi, M. Yoshimura, “Parity violating magnetization at neutrino pair emission using trivalent lanthanoid ions”, Phys. Rev. D 104, 115006 (2021).”

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