

# Quantum entanglement of ions for light dark matter detection

*Thursday, 14 March 2024 17:05 (20 minutes)*

“We explore a detection scheme for light dark matter, such as axion dark matter or dark photon dark matter, using a Paul ion trap system. It turns out that the sensitivities of the Paul ion trap system to axion-photon coupling and gauge kinetic mixing can reach previously unexplored parameter space. Furthermore, we illustrate that an entangled qubit system involving  $N$  ions can enhance the dark matter signal by a factor of  $N^2$  rather than  $N$ .

The talk is based on arXiv: 2311.11632 [hep-ph].”

**Presenter:** ITO, Asuka (QUP/KEK)

**Session Classification:** Oral