



Contribution ID: 32

Type: **not specified**

First Results of DANCE from Long-Term Observation

Thursday, 30 March 2023 10:50 (20 minutes)

Axions are one of the well-motivated candidates for dark matter, originally proposed to solve the strong CP problem in particle physics. Dark matter Axion search with riNg Cavity Experiment (DANCE) is a new experimental project to search for axion dark matter. We aim to detect the rotation and oscillation of optical linear polarization caused by axion-photon coupling with a bow-tie cavity. DANCE can improve the sensitivity to the axion-photon coupling constant in the axion mass range of $10^{-17} \text{ eV} < m_a < 10^{-11} \text{ eV}$ by several orders of magnitude compared to the best upper limits at present. A prototype experiment DANCE Act-1 is ongoing to demonstrate the feasibility of our method. We will report the first results of DANCE Act-1 from 24-hour observation in this workshop. We found no evidence for axions and set 95% confidence level upper limits on the axion-photon coupling $g_{ag} \approx 8 \times 10^{-4} \text{ GeV}^{-1}$ in $10^{-14} \text{ eV} < m_a < 10^{-13} \text{ eV}$. Although the bounds did not exceed the current best limits, this work is the first demonstration of axion dark matter search with an optical ring cavity.

Presenter: OSHIMA, Yuka

Session Classification: Morning session-2