

First observation and analysis of DANCE: Dark matter Axion search with riNg Cavity Experiment

Tuesday, 31 August 2021 17:45 (15)

Dark matter Axion search with riNg Cavity Experiment (DANCE) was proposed. To search for axion-like dark matter, we aim to detect the rotation and oscillation of optical linear polarization caused by axion-photon coupling with a bow-tie ring cavity. DANCE can improve the sensitivity to the axion-photon coupling constant for axion mass $< 10^{-10}$ eV by several orders of magnitude compared to the best upper limits at present. A prototype experiment DANCE Act-1 with a shorter cavity round-trip length of 1 m is ongoing to demonstrate the feasibility of our method and to investigate possible technical noises. We assembled the optics, evaluated the performance of the cavity. The first 12-day observation was successfully performed in May 2021, and the data analysis is underway. In this conference, we will report the principle of DANCE and the status of DANCE Act-1.

Reference to paper (DOI or arXiv)

DOI: 10.1103/PhysRevLett.121.161301, arXiv:2105.06252

Your gender (free text)

Primary author(s) : OSHIMA, Yuka (Department of Physics, University of Tokyo)

Co-author(s) : Mr. FUJIMOTO, Hiroki (Department of Physics, University of Tokyo); Prof. ANDO, Masaki (Department of Physics, University of Tokyo); Dr. FUJITA, Tomohiro (Waseda Institute for Advanced Study, Waseda University); Mr. KUME, Jun'ya (RESCEU, University of Tokyo); Dr. MICHIMURA, Yuta (Department of Physics, University of Tokyo); Dr. MORISAKI, Soichiro (University of Wisconsin-Milwaukee); Dr. NAGANO, Koji (ISAS/JAXA); Mr. NAKATSUKA, Hiromasa (ICRR, University of Tokyo); Dr. NISHIZAWA, Atsushi (RESCEU, University of Tokyo); Dr. OBATA, Ippei (MPA); Mr. WATANABE, Taihei (Department of Physics, University of Tokyo)

Presenter(s) : OSHIMA, Yuka (Department of Physics, University of Tokyo)

Session Classification : Discussion Panel Dark Matter 4

Track Classification : Dark Matter and its detection