

The current status of DANCE:

Dark matter Axion search with riNg Cavity Experiment

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We present the principle of Dark matter Axion search with riNg Cavity Experiment (DANCE) and the status of the prototype experiment, DANCE Act-1. To search for axion-like dark matter, we aim to detect the rotation of an optical linear polarization caused by the axion-photon coupling with a bow-tie ring cavity. The final version of DANCE will improve the sensitivity to the axion-photon coupling constant for axion mass $< 10^{-10}$ eV by several orders of magnitude compared to the current best limits. A prototype experiment DANCE Act-1 with a cavity round-trip length of 1 m is underway to demonstrate the feasibility of our method and to investigate possible technical noises. Even with the shorter cavity round-trip length, smaller finesse and lower input power than the final DANCE, DANCE Act-1 can reach the sensitivity beyond the CAST limit. We have finished the assembly of the optics, locked the laser frequency to the resonance of the ring cavity using Pound-Drever-Hall method, and obtained the first data in August 2020. We are now trying to achieve the design sensitivity of DANCE Act-1 by hunting and reducing noises. In this symposium, we will report the current status of DANCE Act-1.