

CAPP's axion data with mass range from 2.45 to 2.75 GHz

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CAPP's flagship axion experiment, CULTASK, employs dilution refrigerators to lower the physical temperature of resonant cavities to less than 40 mK - the coldest ever for axion search. We prepared a complete set of the microwave axion detector (CAPP-PACE) equipped with an 8 T superconducting magnet with 12 cm inner bore in order to search for axions with mass around 2.5 GHz. The frequency tuning system installed in a split-design resonant cavity with a high Q-factor utilizes piezoelectric actuators with interchangeable sapphire and copper rods and performs flawlessly in searching a wide range of axion mass. The feeble signal (10^{-24} W) from the cavity is amplified and transmitted through the RF receiver chain, specially designed to minimize the noise temperature of the system employing an 1 K HEMT or a quantum-limited SQUID (Superconducting Quantum Interference Device) amplifier in order to raise the sensitivity and eventually speed up the axion search. I will present the results of CAPP's first physics data runs in the axion mass range from 2.45 to 2.75 GHz and discuss our future plans and R&D projects.

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