

The CAPP-MAX axion haloscope: status and prospects

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The axion is a solution to the strong CP problem in quantum chromodynamics. Also, in a particular mass range, axion can be a compelling candidate of the dark matter constituent. CAPP-MAX, a flagship experiment of IBS/CAPP at KAIST, is designed for direct detection of axion dark matter with DFSZ sensitivity. The experiment utilizes a 12 T superconducting magnet and a dilution refrigerator operating at approximately 20 mK. The system also adapts innovative approaches, such as optimizing the volume and weight of the cavity by utilizing the copper foils, and extending the bandwidth of the JPA by bundling them up. The system achieves the total system noise temperature of approximately 200 mK. In this presentation, I will talk about the achievement of the experiment so far in the frequency range of 1.02-1.18 GHz, and the future plan utilizing a configuration of 6 JPAs and a superconducting cavity.

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