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Axion research at IBS/CAPP

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The axion is a hypothetical particle of the Peccei-Quinn solution to the strong-CP problem in particle physics. With some constraints on mass, it also possesses a cosmological implication to account for cold dark matter. Since 2013, IBS/CAPP has been establishing state of the art experiments to search for axion dark matter in Korea. Relying on the cavity haloscope, multiple experiments are operating to explore different mass regions in parallel with high sensitivities. The ultimate goal is to probe the QCD axion models up to 100 μeV. The strategic research efforts are twofold –1) utilizing advanced technologies, including high field superconducting (SC) magnets, cryogenic dilution refrigerators, quantum-limited noise amplifiers, and 2) developing unique features, such as high-Q SC cavities and high-frequency/large-volume cavities. We present the current status and future prospects of the experiments and discuss the R&D activities at IBS/CAPP.

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