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Strategies for high mass axion searches at IBS-CAPP

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The multiple-cell cavity design, developed at IBS-CAPP, was successfully demonstrated, by conducting an axion experiment using a double-cell cavity, as an efficient approach for high-mass axion searches. Using cavities with higher cell-multiplicities, we are currently running parallel experiments for axion searches near 6 GHz and 7 GHz with KSVZ sensitivity relying on dilution refrigerators with superconducting magnets and quantum noise limited amplifiers. We also design meta-material cavities of dielectric rods with a practical frequency tuning mechanism, which is expected to be suitable for even higher-mass axions. In addition, an attempt to develop a microwave photon detector based on the Rydberg atom technology is made in order to improve signal detection performance at high masses. We discuss the experimental strategies for high-mass axion searches at IBS-CAPP.

In-person participation

Yes

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