

New design of multiple-cavity detector for high mass axion dark matter search

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In cavity-based axion dark matter search experiments exploring high mass regions, arrays of multiple cavities are typically considered to increase the detection volume within a given magnet bore. We, IBS/CAPP at KAIST, introduce a new idea, referred to as pizza-cylinder cavity, which is superior to a conventional multiple-cavity detector in terms of detection volume, simplicity of the experimental setup, and facilitation of the phase-matching mechanism. This design is promising for detecting high frequency axion dark matter with enhanced experimental sensitivities. We present the characteristics of this concept and demonstrate the experimental feasibility using a double-cell cavity.

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