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Multiple-cavity detectors for axion dark matter search

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Searching higher frequency regions for axion dark matter using microwave cavity detectors requires smaller size cavities as the resonant frequencies scale inversely with their radius. One of the intuitive ways to make an efficient use of a given magnet volume, and thereby to increase the experimental sensitivity, is to bundle multiple cavities together and combine their individual outputs ensuring phase-matching of the coherent axion signal. The Experiment of Axion Search aT CAPP (EAST-C) is a dedicated project to develop multiple-cavity systems at the Centre of Axion and Precision Physics Research (CAPP) of the Institute for Basic Science (IBS) in Korea. Realistic design of the phase-matching mechanism has been extensively studied and an experimental demonstration has been successfully achieved using a double-cavity system. In this talk, a summary of the study and demonstration will be made and future plans on EAST-C project will be discussed.

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