

# Cavity haloscopes for high-frequency axion search at IBS-CAPP

*mercredi 7 août 2024 08:55 (20 minutes)*

Cavity haloscopes are the most efficient method for searching for axion dark matter in the microwave ( $\mu\text{eV}$ ) region. Current searches are primarily focused on the relatively low frequency (mass) region due to significant losses in detection volume and gradual decreases in the quality factor with increasing frequency. The IBS Center for Axion and Precision Physics Research (IBS-CAPP) has developed several innovative cavity designs to effectively search for axions in the high-mass region. These designs include multiple cells within a conventional cavity, a double-layer tuning mechanism for exploiting higher-resonant modes, and photonic crystal structure of dielectric arrays. In this talk, we present the details of these designs and share experimental search results using various cavities.

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