Contribution ID: **38** Type: **Talk**

Approaching the Quantum Limit in Axion Detection at IBS/CAPP

Tuesday, 17 September 2024 15:35 (20 minutes)

In the presentation, we will detail our five-year work at the Center for Axion and Precision Physics Research (CAPP) in developing and optimizing quantum-noise-limited amplifiers based on flux-driven Josephson Parametric Amplifiers (JPAs) for axion detection experiments. Our research focuses on achieving the lowest noise performance to enhance the scanning speed for detecting potential axion signals in the 1-6 GHz frequency range. We developed a split-band technique for JPAs, extending the effective bandwidth of the 1-2 GHz amplifiers up to 300 MHz while maintaining noise characteristics. We will discuss the technical challenges, implemented solutions, details of the readout systems, and future prospects for this technology.

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Session Classification: Afternoon 2