

Josephson Parametric Amplifiers for Axion Searches

Thursday, 12 January 2017 14:35 (35 minutes)

Measurement of weak signals consisting of few microwave photons requires multiple amplification stages for efficient detection by room temperature electronics. However, state-of-the-art commercially available microwave amplifiers add the equivalent of tens of photons of noise, making them insufficient for the amplification of single- or sub-photon signals. Interest in measuring photon-level signals from superconducting circuits has motivated the intensive development of Josephson parametric amplifiers (JPAs), which have become workhorses of the superconducting qubit field. The robustness and near quantum-limited noise performance of the JPA also make it an appealing candidate for detecting small microwave signals in axion-search experiments. In this talk, we present a brief introduction to JPAs along with an update on devices fabricated and characterized for ADMX.

Primary author: Mr QIU, Yanjie (Quantum Nanoelectronics Laboratory, University of California, Berkeley)

Co-author: Prof. SIDDIQI, Irfan (Quantum Nanoelectronics Laboratory, University of California, Berkeley)

Presenter: Mr QIU, Yanjie (Quantum Nanoelectronics Laboratory, University of California, Berkeley)