



Contribution ID: 75

Type: **not specified**

Superconducting Cavity for Dark Matter Axion Search.

Tuesday, 15 June 2021 13:20 (25 minutes)

A superconducting resonant cavity operational in high magnetic fields is one of the promising ways for enhancing the scanning speed in axion dark matter search. A high-temperature superconductor (HTS) is a natural choice of material for purpose because of its high upper critical field (~ 100 T) and strong vortex pinning characteristics. The deposition, however, of HTS Rare-earth Barium Copper Oxide (ReBCO) in a biaxially-textured form on a curved surface is technically challenging. The IBS Center for Axion and Precision Physics Research (CAPP) in Korea has applied ReBCO tapes to the inner surface of the polygon-shaped resonant cavity to overcome this problem. This talk will show the results from a 2.3 GHz REBCO cavity that maintains a half-million quality (Q) factor in an 8 T magnetic field. The alignment between tapes has been improved compared to the first-generation prototype to enhance the Q factor. The cavity has also been tested with a sapphire rod tuning system utilizing the CAPP-PACE system where a 2.3 GHz Josephson Parametric Amplifier is coupled in the receiver chain. The commissioning results and the plans for further improvements will be presented.

Speaker

Danho Ahn

Primary author: Mr AHN, Danho (KAIST, IBS/CAPP)

Co-authors: Dr PARK, Seongtae (CAPP/IBS); Dr KWON, Ohjoon (IBS/CAPP); Dr BYUN, HeeSu (IBS/CAPP); Mr KIM, Jinsu (KAIST, IBS/CAPP); Dr MATLASHOV, Andrei N. (IBS/CAPP); Dr CHUNG, Woohyun (IBS/CAPP); Prof. YOUM, Dojun (KAIST); Prof. SEMERTZIDIS, Yannis K. (Center for Axion and Precision Physics, IBS)

Presenter: Mr AHN, Danho (KAIST, IBS/CAPP)

Session Classification: Session 5