

R&D on superconducting cavity at IBS/CAPP

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The IBS Center for Axion and Precision Physics Research (CAPP) explores for dark matter axions with tunable resonant cavities immersed in a strong magnetic field to boost the axion-to-photon conversion when a cavity mode resonates with the axion mass. Deposition of superconducting thin films on the inner surface of the cavity increases Q factor of the cavity and thereby enhances the conversion power. However, in the presence of high magnetic fields, Type II superconductors with high critical regions (> 10 T) should be used. In this study, we present various RF characteristics related to superconducting thin films using cylindrical cavities with NbTi coated using the RF magnetron sputtering method; and with YBCO tapes on the inner surface.

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