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Substrate dependent proximity effect of niobium film DANHO

AHN, Department of physics, Korea advanced institute of science and technology, Daejeon, Korea., WON-JUN JANG, Center for axion and precision physics research center, Institute for Basic science, Daejeon, Korea, CHANYOUNG LIM, Department of physics, Korea advanced institute of science and technology, Daejeon, Korea., DOJUN YUM, Department of physics, Korea advanced institute of science and technology, Daejeon, Korea, JHINHWAN LEE, Department of physics, Korea advanced institute of science and technology, Daejeon, Korea., YANNIS SEMERTZDIS, Center for axion and precision physics research center, Institute for Basic science, Daejeon, Korea — Proximity effect between superconductor (SC) and normal metal (NM) is manifested as the diminished superconductivity in SC film by NM substrate. We have studied the magnetron-sputtered and post-annealed niobium film on two different substrates, stainless steel 316 and OFHC copper ($\rho_{\text{SUS}}/\rho_{\text{Cu}} \sim 10^2$). The research shows that a larger conductivity in NM substrate results in a more strongly suppressed superconductivity of the deposited film. We will also show comparison of other characteristics of the SC films related to the superconductivity with analysis techniques such as AFM (atomic force microscopy), SEM (scanning electron microscopy), XPS (x-ray photoelectron spectroscopy), PPMS (physical property measurement system) and MPMS (magnetic property measurement system).

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