

ABSTRACT

Title : Fabrication and Characterization of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ High- T_c SQUID Array Magnetometer

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School : National Kaohsiung University of Applied Sciences

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Researcher : Bo-Ren Cai

Advisor : Jen-Tzong Jeng

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The parameters for making the YBCO SQUID array magnetometer are investigated. Firstly, the high- T_c superconductor YBCO with 90-K transition temperature was deposited by using the rf magnetron sputtering technique. The films are subsequently pattern to form the 93 microbridges of 2- μm wide, of which the resistance-temperature curves and the critical-current densities are measured. The superconducting quantum interference devices are fabricated from the YBCO film grown by rf sputtering on the bicrystal substrate. Each of the 93 devices consists of 5 junctions in parallel to form the superconducting quantum interference grating, of which the voltage-current and the voltage-flux curves are measured. The spreads in critical-current and normal resistance are also analyzed. The 93-channel cryostat built in this work is shown to be a powerful tool in determining the parameter spread of the

device consists of Josephson junction.