

Fabrication of Single Layer $d^2B_z/dxdy$ 2nd-order SQUID Gradiometer

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We have developed a planar-type single layer second-order high- T_c SQUID gradiometer, which is designed to detect the $d^2B_z/dxdy$ of the second-order field gradient. The device consists of four-way 'clover-leaf' pick-up loops that are directly coupled to SQUID. The SQUID has four step-edge Josephson junctions. The pickup loops are intrinsically balanced for both uniform field and the 1st-order gradient. The $YBa_2Cu_3O_7$ thin film was made by using pulsed laser deposition method on $SrTiO_3$ single crystal substrate and patterned by photolithography with Ar ion milling technique. Response of this gradiometer was tested for both uniform field and the 2nd-order field gradient. Details of the design, fabrication, and results will be discussed.

keywords : $d^2B_z/dxdy$, second-order SQUID gradiometer, step-edge junction, $YBa_2Cu_3O_7$