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Measurement of penetration depth of MgB_2 using DC SQUID
DANIEL CUNNANE, KE CHEN, X.X. XI, Temple University — Penetration depth is an important parameter for the design of Rapid Single Flux Quantum (RSFQ) circuits. For MgB_2, different values from 40 nm to 150 nm have been reported by different groups. We have measured the penetration depth of MgB_2 using MgB_2 DC SQUIDs. The SQUID was made using MgB_2/MgO/MgB_2 Josephson junctions with epitaxial MgB_2 electrodes deposited via Hybrid Physical-Chemical Vapor Deposition. The MgO was deposited by RF Magnetron Sputtering of an MgO target. The device shows good voltage modulation above 150 μV. The working temperature for these SQUIDs ranges from below 10K to 37K, with the optimum voltage modulation near 35K. The results will be discussed in comparison to the penetration depth reported by other measurement techniques.

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