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Microwave absorption across phase transitions[1] JUAN GABRIEL RAMIREZ, ALI BASARAN, J. DE LA VENTA, JUAN PEREIRO, I.K. SCHULLER, University of California San Diego — Magnetic Field Modulated Microwave Spectroscopy (MFMMS) is a high-sensitivity technique capable of detecting superconducting phases in volumes as small as 10^{-11} cm^3 even in discontinuous samples. This method measures the temperature dependence of the reflected microwave power from a sample in an oscillating magnetic field. The signature of superconductivity appears as a peak in the reflected microwave power at the transition temperature. However, the absorption mechanism is still unclear. We present an exhaustive number of measurements of known superconductors as well as other materials that undergo phase transitions to test different microwave absorption mechanisms. MFMMS measurements in micro-patterned superconducting structures were performed in order to determine the detection limit of the superconducting volume.

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