

THz Induced Breakdown of Superconductivity in NbN

Tuesday, 24 July 2012 20:00 (2 hours)

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We have begun an experimental study of superconductivity breakdown behavior in a thin NbN film when exposed to a single, strong-field THz pulse. By limiting the THz spectral content to below-gap frequencies, the breakdown is assumed to take place when the induced current density exceeds the critical current density - but the details for this process are mostly unknown due to the onset of thermal effects in typical transport measurements. A finite-difference time-domain approach has been developed to model the process and compared with experimental results that show significant non-linear THz upconversion as breakdown occurs.

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Session Classification: Poster Session 2

Track Classification: Photoinduced Studies