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Magnetic field dependence of the infrared transmittance of superconducting NbTiN¹ D.B. TANNER, J. HWANG, X. XI, H. ZHANG, University of Florida, G.L. CARR, NSLS, Brookhaven National Laboratory — Superconductivity may be destroyed by raising the temperature of the superconductor above the transition temperature or by increasing an applied magnetic field above the upper critical field. We have studied the behavior of key microscopic properties, the superconducting energy gap and the superfluid density, through far-infrared magnetospectroscopy measurements on thin-film Nb_{0.5}Ti_{0.5}N. The measurements were performed at the National Synchrotron Light Source, Brookhaven National Laboratory. As temperature is increased, the gap and the superfluid density are reduced, both reaching zero at T_c . The behavior with field is different. Over much of the range between 0 and 10 T, the gap is almost unchanged, while the superfluid density is reduced, roughly following the area not in vortices in the film. Only near the highest field does the superconducting gap become reduced.

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