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Vortices and multiband superconductivity in NbSe₂ studied by scanning tunneling spectroscopy using a superconducting tip

The core of Abrikosov vortices in NbSe₂ is studied by Scanning Josephson Spectroscopy, SJS. These measurements, which involve Josephson and quasiparticle tunneling, provide a direct insight of the potential well formed by the superconducting order parameter at the vortex core and its variations down to the actual center of the vortex, as well as information about supercurrent densities and magnetic field profiles around the vortices through the analysis of the quasiparticle coherence peaks. Josephson current between the superconducting Pb tip and the NbSe₂ sample is observed to disappear only at the very center of the vortex, while it presents sixfold symmetry around the vortex, similar to the patterns associated to electronic bound states observed in quasiparticle STS on NbSe₂.



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