

Andreev Reflection in Scanning Tunneling Spectroscopy of Unconventional Superconductors

We evaluate the differential conductance measured in a scanning tunneling microscopy (STM) setting at arbitrary electron transmission between STM tip and a two-dimensional superconductor with arbitrary gap structure. Our analytical scattering theory accounts for Andreev reflections, which become prominent at larger transmissions. We show that this provides complementary information about the superconducting gap structure beyond the tunneling density of states, strongly facilitating the ability to extract the gap symmetry and its relation to the underlying crystalline lattice.