

Modeling the Electron Spin Resonance Spectrum in Scanning Tunneling Microscopy

Christian R. Ast

Max-Planck-Institute for Solid State Research, Stuttgart, Germany

The theory of electron spin resonance (ESR) spectroscopy in scanning tunneling microscopy (STM) has been debated for some time now with a number of different proposals having different origin, but essentially leading to very similar results. While the focus so far has been on the ESR signal itself, the measured DC tunneling spectrum offers more details that allow for a more precise verification of the underlying theory. Here, we discuss the ESR signal from a theory point of view by allowing the tunneling electrons to interact with both the driven spin system and the incident microwave during the tunneling process. We find a more complete description of the whole tunneling current also going beyond the typical approximation of a constant density of states.