Quasiparticle Interference in Superconducting Layered Misfit Compound $(LaSe)_{1.14}NbSe_2$

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Abstract. Unconventional superconductivity in transition metal dichalcogenides exhibits a special form of Ising pairing mechanism, with interesting consequence where in-plane upper critical magnetic fields is much higher than the Pauli limit. Misfit layered $(LaSe)_{1.14}NbSe_2$ is a stack of transition metal dichalcogenide $NbSe_2$ layers intercalated by the LaSe layers. The system is bulk superconductor indicating unique three-dimensional Ising superconductor. We investigate possible quasiparticle interference patterns relevant for Fourier-transform scanning tunneling spectroscopy. We discuss effect due to scalar and magnetic impurity in normal and superconducting state for conventional and unconventional pairing parameters using T-matrix approach. For electronic structure we employ tight-binding model fitted to the first-principles calculations.

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