Fermi Surface Approach to Inelastic Neutron Scattering Data in Cuprates¹

MICHAEL NORMAN, Materials Science Division, Argonne National Laboratory

A large body of calculations has been done to address inelastic neutron scattering data on cuprate superconductors based on linear response theory with a d-wave energy gap. I will review these calculations, emphasizing unique aspects that they can explain in regards to the data. This includes the magnetic resonance, with its unusual “reversed magnon” dispersion [1], and a novel new resonance mode which occurs at higher energies and at smaller momenta, which can account for the unusual “45 degree rotation” of the 2D momentum pattern seen in recent neutron data [2]. Finally, I will discuss limitations of these calculations in regards to certain experimental findings.


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