Quasiparticle Scattering Interference in Electron-Doped Cuprate Superconductors

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Within the kinetic energy driven superconducting mechanism[1],the quasiparticle scattering interference phenomenon and the related quasiparticle extinction in the electron-doped cuprate superconductors is studied in the presence of a single impurity. By calculation of the Fourier transformed ratio of the local density of states at opposite energy, it is shown that the quasiparticle scattering interference phenomenon can be reproduced qualitatively by a single impurity in the kinetic energy driven nonmonotonic d-wave superconducting state. In analogy to the hole-doped case[2], the amplitude of the quasiparticle peak increases at the low energy, and reaches a maximum at the intermediate energy, then diminishes to zero at the high energy.

[1]Shiping Feng, Phys. Rev. B **68**, 184501 (2003); Shiping Feng, Tianxing Ma, and Huaiming Guo, Physica C **436**, 14 (2006).
[2]Zhi Wang, Bin Liu, Shiping Feng, Phys. Lett. A **374**, 3084 (2010).