

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Quasiparticle states around a nonmagnetic impurity in the spin-density-wave state of iron-pnictide superconductors TAO ZHOU, HUAIXIANG HUANG, YI GAO, University of Houston, JIANXIN ZHU, Los Alamos National Laboratory, C.S. TING, University of Houston — The quasiparticle states around a non-magnetic impurity in the electron doped iron-based superconductors with the presence of spin-density-wave (SDW) ordering will be investigated as a function of doping and for various impurity strengths. We found that In the undoped sample, two resonance peaks are found to approach the Fermi level on the impurity site with the strength of scattering potential increasing from weak to moderate. For doped samples, where the SDW order and the superconducting order coexist, there are two intra-gap resonance peaks for weak scattering potential. For strong scattering potential, one sharp peak appears near fermi energy in underdoped sample and separates to two peaks for larger dopings. For all the cases, the local density of states exhibits clear C_2 symmetry. Our results provide an effective tool to detect the SDW order and probe the coexistence of the SDW and superconducting orders.

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Date submitted: 03 Feb 2011

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