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Neutron spin resonance study in Co-doped NaFeAs CHENGLIN ZHANG, Rice University, Physics Dept, EGAMI TAKESHI, Oak Ridge National Lab, PENGCHENG DAI, Rice University, Physics Dept, UTK AND RICE TEAM — Since the discovery of iron superconductors, the (Ba,Sr,Ca)Fe₂As₂ (“122”) family especially electron doped side has been subjected to heavily study by neutron scattering. One of the pronounced features generally observed in bulk superconducting compositions is a broad resonance along antiferromagnetic order wave vector. The resonance energy linearly scales with T_c. However, our neutron study shows that Co-doped NaFeAs system exhibits complexity, distinguishing itself from “122” system. We observed a sharp resonance in the electron-overdope regime, providing strong evidence for S_± pairing symmetry in pnictide superconductors. In the underdoped regime, we find double resonances at commensurate wave vector, demonstrating the multi-orbital nature of pnictides. Our finding further suggests that the resonance energy and T_c may not be simply correlated in multiband superconductors such as iron pnictides. We will discuss in detail how resonances evolve with electron doping.

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