

Abstract Submitted
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Decoupling neutron resonances from superconducting transition temperatures in $\text{NaFe}_{1-x}\text{Co}_x\text{As}$ CHENGLIN ZHANG, Rice University, EGAMI TAKESHI, University of Tennessee, PENGCHENG DAI, Rice university, RICE UNIVERSITY TEAM, UNIVERSITY OF TENNESSEE TEAM — We report a comprehensive study of the evolution of neutron resonance modes in wide doping range of $\text{NaFe}_{1-x}\text{Co}_x\text{As}$. Double resonances, a sharp followed by a broad one, are observed in certain underdoped region. Surprisingly, the sharp resonance energy is nearly unchanged with variation of doping concentrations and therefore T_c . In overdoped region without competing phases, single resonance presents and is gradually broadening with further increasing doping. Nevertheless, the resonances peak at the same energy while T_c falls half from slightly overdoped one ($T_c=18$ K) to heavily overdoped one ($T_c = 9$ K). The decoupling between E_r and T_c indicates unappreciated coherence which had not been predicted by any theoretical models. Our results manifest the distinct multiorbital character in FeSC, guiding a new direction in the pursuit of a generic connection in diversified unconventional superconductors.

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