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Spin excitations in iron arsenide superconductors

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We used neutron scattering to study the spin excitations of the optimally electron doped BaFe1.9Ni0.1As2 (Tc =20 K) iron arsenide superconductor. We found a magnetic field that suppresses the superconductivity and superconducting gap energy also reduces the intensity and energy of the resonance. Our results suggest that the energy of the resonance is proportional to the electron pairing energy, and thus indicate that spin fluctuations are intimately related to the mechanism of superconductivity in iron arsenides.