

Abstract Submitted  
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**Spin Excitations in Overdoped  $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$**  A.D. CHRISTIANSON, S. CALDER, J.E. MITCHELL, K. MARTY, C.H. WANG, M.B. STONE, A.S. SEFAT, B.C. SALES, M.D. LUMSDEN, Oak Ridge National Laboratory — The relationship between spin excitations and unconventional superconductivity has been and continues to be the subject of considerable experimental and theoretical scrutiny. While the underdoped and optimally doped regions of the phase diagrams of unconventional superconductors have been extensively studied there have few studies of the spin excitations in the overdoped region. Here we report an inelastic neutron scattering study of an overdoped sample of the unconventional superconductor  $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$  with  $x=0.15$  and  $T_c = 12$  K. At energies below 40 meV the spin excitations are much broader and weaker when compared to samples close to optimal doping. Despite the weakness of the spin excitations a broad spin resonance is still observed at an energy of  $\sim 8$  meV at the wave vector  $(0.5\ 0.5\ 0)$ . This corresponds to a value of  $7.7 K_B T_c$  which is nearly double the value of  $4 K_B T_c$  found for many Fe-based superconductors.

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