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**Coherence peak and pair-breaking effects in the ac conductivity of  $\text{BaFe}_{2-2x}\text{Co}_{2x}\text{As}_2$  epitaxial thin films** N.P. ARMITAGE, ROLANDO VALDÉS AGUILAR, L.S. BILBRO, The Johns Hopkins University, S. LEE, C.W. BARK, C.B. EOM, University of Wisconsin, THE JOHNS HOPKINS UNIVERSITY TEAM, UNIVERSITY OF WISCONSIN TEAM — We report a study of high quality pnictide superconductor  $\text{BaFe}_{1.84}\text{Co}_{0.16}\text{As}_2$  epitaxial thin films using time-domain THz spectroscopy. Near  $T_c$  we find evidence for a coherence peak and qualitative agreement with the weak-coupling Mattis-Bardeen form of the conductivity. At low temperature, we find that the real part of the THz conductivity is not fully suppressed and  $\sigma_2$  is significantly smaller than the Matthis-Bardeen expectation. The temperature dependence of the penetration depth  $\lambda$  follows a power law with an unusually high exponent of 3.1. We interpret these results as consistent with impurity scattering induced pair-breaking. Taken together our results are strong support for an extended  $s_{\pm}$  symmetry order parameter.

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