

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Wall-like spin excitations in A-type antiferromagnetic  $\text{CaCo}_2\text{As}_2$ <sup>1</sup>**

A. SAPKOTA, B. G. UELAND, ABHISHEK PANDEY, D. C. JOHNSTON, A. KREYSSIG, R. J. MCQUEENEY, A. I. GOLDMAN, Ames Laboratory, Dept. of Physics and Astronomy, Iowa State University, V. K. ANAND, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, J. L. NIEDZIELA, D. L. ABERNATHY, Oak Ridge National Laboratory — The  $\text{ACo}_2\text{As}_2$  ( $A = \text{Ca}, \text{Sr}, \text{Ba}$ ) compounds are structurally and chemically similar to  $\text{AFe}_2\text{As}_2$  and possess some interesting similarities and differences in their magnetism. We recently discovered that  $\text{SrCo}_2\text{As}_2$  has stripe antiferromagnetic (AFM) spin correlations similar to stripe-ordered  $\text{AFe}_2\text{As}_2$ . On the other hand,  $\text{CaCo}_2\text{As}_2$  orders in an A-type AFM structure with ferromagnetic correlation of the spins in the square-lattice Co-layer and AFM correlations between layers. Despite the A-type order, our recent inelastic neutron scattering measurements show that spin excitations in  $\text{CaCo}_2\text{As}_2$  are not associated with either the A-type or stripe-type order. Instead, we observe broad excitations that extend longitudinally (along (1,1,0) in reciprocal space), but remain sharply defined in the transverse direction. These excitations seem to be best characterized as a “wall” of scattering and suggest that  $\text{CaCo}_2\text{As}_2$  has quasi-one-dimensional spin dynamics very different than in  $\text{AFe}_2\text{As}_2$  and  $\text{SrCo}_2\text{As}_2$ .

<sup>1</sup>Work at Ames Laboratory was supported by US DOE, Basic Energy Sciences, Division of Materials Sciences and Engineering, under Contract No. DE-AC02-07CH11358. Work at ORNL was supported by US DOE, Office of Basic Energy Sciences, Scientific User Facilities Division.

Aashish Sapkota  
Ames Laboratory/Iowa State University

Date submitted: 05 Nov 2015

Electronic form version 1.4