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**Spin excitations in the A-type antiferromagnet $CaCo_2As_2$**[1] R.J. MCQUEENEY, B.G. UELAND, A. SAPKOTA, ABHISHEK PANDEY, G.S. TUCKER, Ames Laboratory and Iowa State University, D.L. ABERNATHY, J.L. NIEDZIELA, Oak Ridge National Laboratory, A. KREYSSIG, D.C. JOHNSTON, A.I. GOLDMAN, Ames Laboratory and Iowa State University — $CaCo_2As_2$ is an A-type antiferromagnetic (AFM) metal with net ferromagnetic interactions between Co ions within the square-lattice layer and AFM interactions between layers. The material is isostructural to $AFe_2As_2$ (A=Ca, Sr, Ba) based high-temperature superconductors, although the stripe AFM magnetism is manifestly different from the nearly ferromagnetic $CaCo_2As_2$ compound. Surprisingly, AFM stripe spin correlations similar to those found in the iron arsenides are observed in the closely related paramagnetic $SrCo_2As_2$ system. We have studied spin excitations in $CaCo_2As_2$ using inelastic neutron scattering. While we find that low-energy Goldstone modes appear at the A-type AFM wavevector, broad and quasi-one-dimensional spin excitations spanning both A-type and stripe AFM wavevectors persist up to very high energies ($> 150$ meV) and share many similarities to $SrCo_2As_2$. Combined with the small ordered moment ($< 0.5\ \mu_B$/Co) of $CaCo_2As_2$, the results suggest that the cobalt arsenides are itinerant magnetic systems where the net magnetic exchange interactions place them close to a quantum critical point separating stripe AFM and ferromagnetic ground states.

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