

Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Observation of half-quantum vortices in an antiferromagnetic spinor Bose-Einstein condensate SANG WON SEO, SEJI KANG, WOO JIN KWON, YONG-IL SHIN, Seoul Natl Univ — We report the observation of half-quantum vortices (HQVs) in an antiferromagnetic spinor Bose-Einstein condensate. We realize the easy-plane polar or antiferromagnetic (AF) phase of the spin-1 sodium condensate by tuning the sign of the quadratic Zeeman energy with microwave dressing field. The manifold of the order parameter of this phase is given as $[U(1) \times S^1]/Z_2$ and HQVs are allowed as topological defects in this system. Using in-situ magnetization-sensitive imaging, we observe that a singly charged vortex splits into a pair of HQVs with ferromagnetic vortex cores of opposite magnetization. The magnetized core of the HQV is measured to be about three times of the spin healing length, which is in good agreement with mean-field predictions.

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Date submitted: 27 Jan 2015

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