

Abstract Submitted  
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**Magnetic solitons in a spin-1 Bose-Einstein condensate**<sup>1</sup> DI LAO, XIAO CHAI, Georgia Inst of Tech, KAZUYA FUJIMOTO, Nagoya University, RYUSUKE HAMAZAKI, MASAHIITO UEDA, University of Tokyo, CHANDRA RAMAN, Georgia Inst of Tech — Vector soliton are a type of solitary wave packet occurring in a nonlinear medium comprised of multiple components. They have been discovered in a variety of systems including ultracold atoms. In this talk, we report the observation of a new type of soliton, called a magnetic soliton, in a spinor BEC beyond the usual Manakov limit of the 1-dimensional Gross-Pitaevskii (GP) equations. By using a “magnetic shadowing” technique that only affects the spin and is therefore non-destructive, we created a pair of magnetic solitons in an anti-ferromagnetic spinor BEC. In addition, multiple solitons can be created by spatially modulating the pattern of the magnetic shadow, which allows the investigation of soliton interactions, collisions and possible bound states.

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