

Abstract Submitted  
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**Antiferromagnetic spinor condensates in a bichromatic superlattice**<sup>1</sup> TAO TANG, LICHAO ZHAO, ZIHE CHEN, YINGMEI LIU, Department of Physics, Oklahoma State University — A spinor Bose-Einstein condensate in an optical superlattice has been considered as a good quantum simulator for understanding mesoscopic magnetism. We report an experimental study on an antiferromagnetic spinor condensate in a bichromatic superlattice constructed by a cubic red-detuned optical lattice and a one-dimensional blue-detuned optical lattice. Our data demonstrate a few advantages of this bichromatic superlattice over a monochromatic lattice. One distinct advantage is that the bichromatic superlattice enables realizing the first-order superfluid to Mott-insulator phase transitions within a much wider range of magnetic fields. In addition, we discuss an apparent discrepancy between our data and the mean-field theory.

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