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Metastable polar state of a spin-1 antiferromagnetic Bose-Einstein condensate under a magnetic field gradient JOON HYUN KIM, SEJI KANG, DEOKHWA HONG, YONG-IL SHIN, Seoul National University — We study metastable polar states in a spin-1 antiferromagnetic spinor Bose-Einstein condensate (BEC) under a magnetic field gradient. For negative quadratic Zeeman energy q, the system's ground state is an easy-plane polar (EPP) state and the sample in an easy-axis polar (EAP) state would undergo a quench evolution into the ground EPP state via spin-exchange collision. In the presence of magnetic field gradient, however, we have observed that the BEC prepared in the EAP state becomes dynamically stable down to a certain negative q value. We measure the threshold q value for the metastable EAP state as a function of the field gradient and we also find that the metastable state becomes more robust with decreasing the spatial size of the sample. We will discuss the physical origin of the metastability of the spinor BEC system.

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