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Majorana bound state in a magnetic biskyrmion GUANG YANG, RIKEN Center for Emergent Matter Science (CEMS), Wako 351-0198, Japan, DANIEL LOSS, Department of Physics, University of Basel, Klingelbergstrasse 82, CH-4056 Basel, Switzerland — Magnetic biskyrmion, recently discovered [1] in thin film dipolar ferromagnet with uniaxial anisotropy, is a highly mobile nanoscale topological spin texture. We show that a magnetic biskyrmion in proximity to an s-wave superconductor supports a zero-energy Majorana bound state in its core. The Majorana bound state can be manipulated through driving the motion of the magnetic biskyrmion with electric current. We discuss the realization of non-Abelian statistics of such Majorana bound states.

[1] X. Z. Yu, Y. Tokunaga, Y. Kaneko, W. Z. Zhang, K. Kimoto, Y. Matsui, Y. Taguchi, and Y. Tokura, Nature Communications 5, 3198 (2014).

Guang Yang
RIKEN Center for Emergent Matter Science (CEMS), Wako 351-0198, Japan

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