Abstract Submitted
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Tunable skyrmionic states by the magnetic field in a nanodisk of chiral magnets HANG LI, Univ of New Hampshire, HAIFENG DU, Chinese Academy of Science, JIADONG ZANG, Univ of New Hampshire, HIGH MAGNETIC FIELD LAB COLLABORATION, THEORETICAL PHYSICS TEAM — Experimental observations of magnetic skyrmions, have been recently addressed in numerous non-centrosymmetric ferromagnetic materials [1]. In most previous reports, skyrmions are only stabilized in the presence of an external magnetic field. However, even without the magnetic field, skyrmions can be also generated in ultrasmall nanodisks by a reasonably structural design. We investigate the spin textures in FeGe nanodisks, and find two types of skyrmions with opposite core polarizations, which can be switched by the external magnetic field. Our results are in good agreement with recent experimental observations. Our numerical results also show the parametric dependences of the different skyrmion states, which exhibit similarities to the localized states and open a new avenue to the development of skyrmionic devices by structural designs. [1] Naoto Nagaosa and Yoshinori Tokura, Nat. nano. 8, 899(2013).

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