

Abstract Submitted
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Skyrmion-Antiskyrmion pair creation by in-plane currents¹ MARTIN STIER, University of Hamburg, WOLFGANG HUSLER, University of Augsburg, THORE POSSKE, GREGOR GURSKI, MICHAEL THORWART, University of Hamburg — Magnetic Skyrmions are considered to be topologically protected particles. Due to this stability, their small size and the possibility to move them by low electric currents they are proper candidates for spintronic devices. However, without violating this topological protection, it should be possible to create Skyrmion-Antiskyrmion pairs as long as the total Skyrmion number does not change. In fact, we derive a Skyrmion equation of motion and show that electric currents can create such Skyrmion-Antiskyrmion pairs. By this equation of motion we are able to give general prerequisites for this pair creation process. We confirm these results by numerical simulations. On a lattice, where topological protection gets imperfect, the Antiskyrmions in these pairs can be destroyed and only the Skyrmions remain. This eventually changes the total Skyrmion number and yields new ways of creating and controlling Skyrmions.

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Martin Stier
University of Hamburg

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