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Relaxation dynamics of interacting skyrmions in thin films[1] BART BROWN, MICHEL PLEIMLING, Virginia Tech — Magnetic skyrmions are topologically protected spin textures which were recently observed in certain chiral magnets such as MnSi. Skyrmions can be moved by very low current densities (five orders of magnitude less than typical magnetic domain walls) which makes them very promising in spintronics applications. A thorough understanding of the relaxation processes for systems of interacting skyrmions far from equilibrium could prove invaluable in real world applications but is currently lacking in the literature. The dynamics are described by the Landau-Lifshitz-Gilbert (LLG) equation, however, simulating many interacting skyrmions by solving the LLG equation is computationally infeasible. In order to explore these relaxation processes, we employ a suitable two-dimensional particle based model derived from Thiele's approach. We find that the scaling properties of the density-density correlation function depend non-trivially on the magnitude of the Magnus force, which points perpendicular to the skyrmion velocity in the plane, and on the Gaussian noise term.

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