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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 and thin films. Skyrmions can be moved by very low current densities which makes them very promising in spintronic applications such as data storage devices and logic gates. 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. We employ a suitable two-dimensional particle based model derived from Thiele's approach to study the two-time density correlation function and other quantities. The particle model differs most notably from similar models which describe vortices in type-II superconductors by the addition of the Magnus force which points perpendicular to the skyrmion velocity in the plane. Numerical studies reveal non-universal scaling of the correlation function where the scaling exponent is a function of the ratio of the Magnus force strength to damping coefficient as well as of the Gaussian noise.

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