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Topological Hall and Spin Hall Effects in Disordered Skyrmionic Textures¹ PAPA BIRAME NDIAYE, COLLINS AKOSA, AURELIEN MANCHON, King Abdullah University of Science and Technology (KAUST), SPINTRONICS THEORY GROUP TEAM — We carry out a throughout study of the topological Hall and topological spin Hall effects in disordered skyrmionic systems: the dimensionless (spin) Hall angles are evaluated across the energy band structure in the multiprobe Landauer-Büttiker formalism and their link to the effective magnetic field emerging from the real space topology of the spin texture is highlighted. We discuss these results for an optimal skyrmion size and for various sizes of the sample and found that the adiabatic approximation still holds for large skyrmions as well as for few atomic size-nanoskyrmions. Finally, we test the robustness of the topological signals against disorder strength and show that topological Hall effect is highly sensitive to momentum scattering.

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