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Gamma-convergence of two-dimensional lattice models of magnetic skyrmions.

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We consider energies defined on maps from a 2-dimensional lattice to the unit sphere in R^3, consisting of a (discrete) exchange energy term competing with a (discrete) Dzylashinksii- Moriya interaction term, and assuming suitable boundary conditions outside a regular set Ω.

Under additional constraints we prove the asymptotics of these energies to a confined model of magnetic skirmions in the continuum for ultrathin ferromagnetic films. More in details, we treat the two cases in which we assume bounds on a 'relaxed' discrete degree of the maps or on their oscillations.

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