

Analysis on the stability of in-surface magnetic configurations in toroidal nanoshells

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Curvature of nanomagnets can be used to induce chiral textures in the magnetization field. Here we perform analytical calculations and micromagnetic simulations aiming to analyze the stability of in-surface magnetization configurations in toroidal nanomagnets. We have obtained that despite toroidal vortex-like configurations are highly stable in magnetic nanotori, the interplay between geometry and magnetic properties promotes the competition between effective interactions yielding the development of a core in a vortex state when the aspect ratio between internal and external radii of nanotorus is ≈ 0.75 .