

Twisted skyrmions through dipolar interactions

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The manifestations of the dipolar interaction in magnetic nano-devices can take subtle forms. In this work, we address the effects of dipolar interactions on skyrmions textures. The so-called twisted skyrmion is a natural state between the Bloch skyrmion, that arises from the bulk-like Dzyalonshtinskii-Moriya (DM) interaction, and the Néel-skyrmion, that results from the interfacial form of the DM interaction. Often neglected, or approximated by local interactions, we show how, when explicitly included, dipolar interactions generate gaps in the phase diagram for certain helicities. Besides, this interaction allows the existence of skyrmions with two chiralities, which are unstable when the dipolar interaction is approximated by a shape anisotropy. © 2019 Elsevier B.V.