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Micromagnetism in the ultrathin limit DANILO PESCIA, OLIVER PORTMANN, MATTHIAS BUESS, ALESSANDRO VINDIGNI, ANDREAS VATERLAUS, Laboratory for Solid State Physics, ETH Zurich, CHRISTIAN HORST BACK, Institut für Experimentelle und Angewandte Physik, Universität Regensburg, — We derive some results concerning the static and dynamic micromagnetic behavior of magnetic elements in the ultrathin limit. In this limit, a most remarkable, shape-independent, logarithmic correction of the magnetostatic energy appears, produced by the long-range character of the dipolar interaction. Apparently unrelated phenomena such as the pinning of the precessional motion at some of the boundaries of a thin magnetic element, the non-pinning at other boundaries and a multi-to-single-domain transition in ultrathin elements with perpendicular magnetization have a common origin: the logarithmic correction.

Danilo Pescia

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