Title

Symmetry-dependent domain wall propagation in triangular nanowires

Abstract

Magnetic domain walls (DW) are interesting for several technologies requiring perfect control of their propagation along a nanostructure. Therefore, it is necessary to better understand their dynamics. In this paper, using micromagnetic simulations, we analyze the DW propagation along nanowires (NWs) with triangular cross-section, clarifying the role of cross-section symmetry on the DW velocity. Our results evidence that the lowest DW velocity occurs for equilateral triangles. Such behavior is strongly associated with changes in the magnetic energy of the system during DW rotation around the NW axis. Since fully regular cross-sections cannot be easily fabricated, studying the DW dynamics in NWs with non-regular cross-sections could be useful for experimental works. © 2024 Elsevier B.V.

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