

Measuring interfacial Dzyaloshinskii-Moriya interaction in a Pt/Co/Pt structure dusted by Gd via asymmetric domain wall expansion

F. Dörr,¹ C. Deger,² R. Marcedo,³ S. Cardoso,^{3,4} M. Erkovan,^{3,4} P. Fumagalli,¹ and Y. A. Shokr^{1,5}

¹*Institut für Experimentalphysik, Freie Universität Berlin, Arnimallee 14, 14195 Berlin, Germany*

²*Marmara University, Physics Dept. 34722, Ziverbey, Istanbul, Turkey*

³*Instituto de Engenharia de Sistemas E Computadores – Microsistemase Nanotecnologias (INESC MN) Lisbon, 1000-029, Portugal*

⁴*Instituto Superior Tecnico (IST), Universidade de Lisboa, 1040 001 Lisbon, Portugal*

⁵*Faculty of Science, Department of Physics, Helwan University, 17119 Cairo, Egypt*

Efficient manipulation of topological spin textures in multilayer stacks might be achieved by breaking spatial inversion symmetry at the interfaces. Such an approach could become important for spintronic applications. The symmetry breaking at interfaces increases chiral phenomena, which could yield new material properties. In ferromagnetic (FM) thin films, the chiral exchange interaction is known as interfacial Dzyaloshinskii–Moriya interaction (iDMI). So, manipulating the iDMI could provide a general route to tailor chirality in magnetic materials through interface engineering. In this study, the influence of a Gd dusting layer on PMA and iDMI was measured via asymmetric domain-wall expansion by Kerr microscopy in a Pt/Co/Pt base structure. The measurements show that the existence of the Gd dusting layer enhanced the iDMI, while the strong PMA of the system is preserved. We expect that this study could inspire future considerations about the influence of rare-earth-element dusting on magnetic properties and might open new strategies for Skyrmion stabilization in metallic FM systems.