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Fe at the interface with 2D-transition metal dichalcogenides and topological insulators (invited)

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The integration of ferromagnetic thin films (FM) with the classes of two dimensional (2D) transition metal dichalcogenides (TMD) and topological insulators (TI) constitutes a very promising route to build-up the next generation of spintronic devices [1]. In particular, the use of TMD and TI can boost the efficiency of the spin orbit torque exerted to an adjacent FM layer, by taking advantage from the large intrinsic spin orbit coupling in TMD, and from topologically protected spin-polarized edge states in TI. In this contribution we present the structure, chemical composition and magnetism of the interface between Fe thin films and two prototype 2D-TMD and TI systems, namely 2D-MoS2 and Sb2Te3 as mainly obtained by means of conversion electron Mössbauer spectroscopy (CEMS) [2,3]. Our results constitute a first step toward the full understanding of the interface properties of these systems, with the perspective to engineer ultra-low-power spintronic devices in the near future.

[1] F. Hellman et al., Rev. Mod. Phys. 89, 025006 (2017)
[2] R. Mantovan et al., Phys. Status Solidi A 215, 1800015 (2018)
[3] E. Longo et al., J. Magn. Magn. Mat. 474, 632 (2019)

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