Functional materials for spintronics

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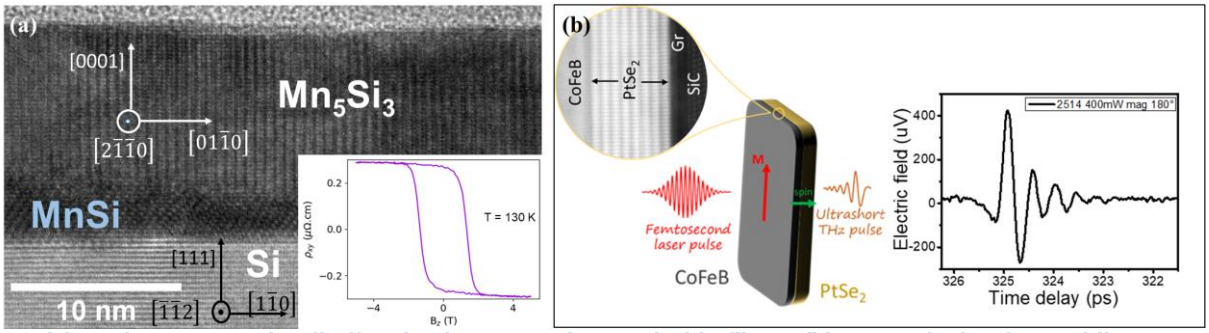
Spintronics aims at using the degree of freedom of spins to develop energy-efficient and high-performance electronics. This discipline has recently been recognized as a priority at national level with the launch of the PEPR SPIN. One of the main limitations is the growth of functional materials with high crystalline quality for targeted applications such as spin-charge interconversion. Recently, new classes of materials have demonstrated unique properties for spin generation, manipulation and detection: topological insulators, two-dimensional materials, Dirac or Weyl semi-metals, non-collective antiferromagnetic antiferromagnetic and altermagnetic materials, Rashba interfaces, Heusler, oxides... What recent advances have been made in epitaxial growth to improve control over the structural and physical properties of these materials? What are the obstacles to their growth and integration into spintronic devices?



(a) Robust anormal Hall effect in altermagnetic Mn_5Si_3 thin films ; (b) THz emission from a bilayer CoFeB/$PtSe_2$.

The aim of the minicolloquium is to bring together specialists in the epitaxial growth of these emerging materials that hold great promise for spintronic applications.