

MMPS18 Multiferroics/Ferroelectrics: Innovative Properties and Applications

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Parrainage ou lien avec des sociétés savantes, des GDR ou autres structures :

GDR Meeticc - Matériaux, Etats Electroniques, Interactions et Couplages non-Conventionnels
(350 chercheurs issus de 95 équipes et 44 laboratoires)

GDR Seeds - Systèmes d’Energie Electrique dans leurs Dimensions Sociétales.
(30 laboratoires et un potentiel de 400 chercheurs)

RÉMiSol - Réseau Microscopies à Sondes Locales.

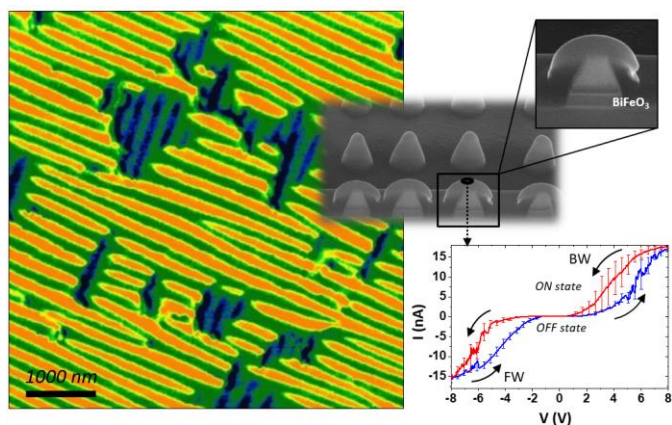
SFP - Société Française de Physique

EPS - European Physical Society

Résumé :

The development of modern electronic devices is associated with the improvement of their characteristics such as commutation speed, density of elements, energy consumption, etc. In the last years, there was an intense research interest in alternative technologies for fast and non-destructive readout in non-volatile memories such as ferroelectric random access memories (FeRAM),^{1,2} resistive random access memory (ReRAM), memristors³ or “racetrack memories”.⁴ In this manner, multiferroic/ferroelectric materials have a boundless interest due to their polarization dependent electronic transport properties.^{5,6} Bulk multiferroics/ferroelectrics can provide robust ferroelectricity,⁷ while electronic properties of thin films can be adjusted by mean of electrode/oxide interface and offer control of ferroic orders (ferroelectric, ferroelastic, anti-ferromagnetic).^{8,9} Multiferroic/ferroelectric nanostructures allow modifying or enhancing functional properties (for instance magnetic and photocatalytic) due to scaling effect. The great variety of physical properties suggests future discoveries of new functional behaviours.

This “mini-colloque” will be dedicated to multiferroics/ferroelectrics, their innovative properties and applications. Several teams belonging to French national scientific groups like GDR Meeticc, GDR Seeds, RÉMiSol microscopy network and the French Physics Society will meet to present their recent studies to share and motivate other explorations in this domain.



Ferroelectric domains and ferroelectric nanocapacitors

Références :

1. C. Gaumer, et. al Microelec. Engin. 88, 72, 2011.
2. N. Alyabyeva, et al Submitted to Adv. Fun. Mat., 2019.
3. A. Chanthbouala, et. al Nat. Mat. 11, 860–864, 2012.
4. S. S. P. Parkin, et. al, Science 320, 190-194, 2008
5. E. Ressouche, et. al Phys. Rev. B 82, 100408, 2010.
6. J. Engelmayer, et. al Phys. Rev. Mat. 3, 051401, 2019.
7. O. Turki, et. al J. of App. Phys. 125, 174103, 2019.
8. C. Daumont1, et. al Appl. Phys. Lett. 112, 112401, 2018.
9. S. Boyn, et. al Nat. Com. 8, 14736, 2017.