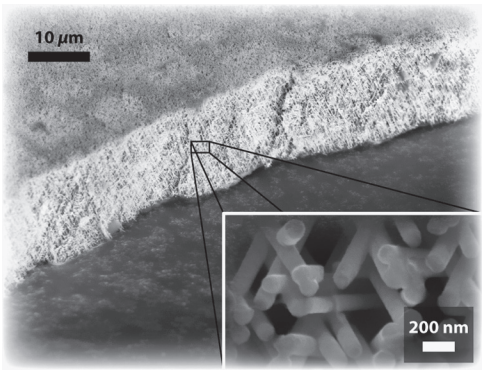


Fig.1: SEM image of a self-supported interconnected NW network film. The inset highlights the NW branched structure.

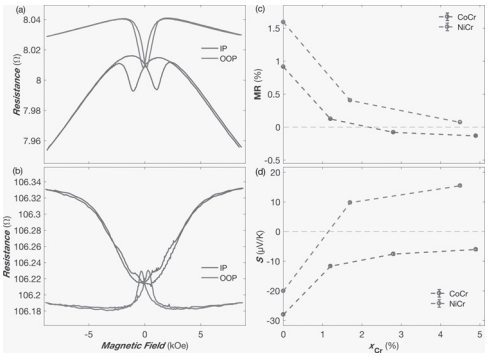


Fig. 2: (a-b) Anisotropic magnetoresistance curves for interconnected nanowire networks made of (a) Co and (b) diluted CoCr alloy (5% of Cr). (c) Magnetoresistance ratio MR and (d) Seebeck coefficient *S* with respect to the Cr contain in interconnected nanowire networks made of CoCr and NiCr diluted alloys.

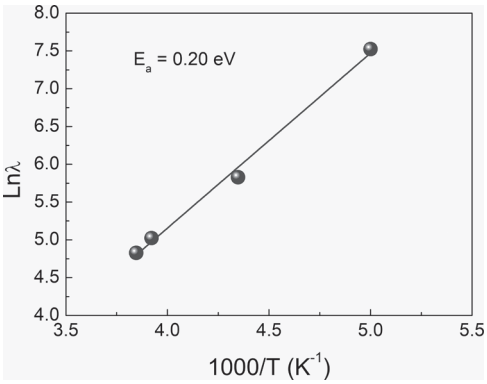
BT-18. Interplay between magneto-elasticity and magneto-electricity in FePt/$BaTiO_3$. *Q. Ain*[1], D. Odkhuu[2], S.H. Rhim[1] and S.C. Hong[1] *1. University of Ulsan, Ulsan, The Republic of Korea; 2. Incheon National University, Incheon, The Republic of Korea*

Using first-principles calculations, the interplay between magneto-electricity (ME) and magneto-elasticity (MEL) is investigated. As a prototype, magnetization of epitaxial FePt heterostructure on $BaTiO_3$ is explored, where TiO_2-terminated interface is taken into account. In particular, the interfacial ME coefficient,a_l= $3.56x10^{-9}$ $G.cm^2/V$, one order larger than Fe/$BaTiO_3$ interface [1], as a consequence of considerable difference in magnetization under the polarization (P) reversal at the interface. Furthermore, strain (η) significantly modifies the interfacial electronic structure when P>0 as compared to P<0. At zero-strain, out-of-plane magnetization is preferred regardless of polarization directions. However, at η =1.75%, magnetization switches from out-of-plane (P<0) to in-plane (P>0). The interplay is analyzed by the different responses of out-of-plane (*xz*and *yz*) and in-plane (*xy* andx^2-y^2) orbitals with respect to strain and polarization, where the magnetization direction is governed by and matrices.

C.-G. Duan, S.S. Jaswal, and E. Y. Tsymbal, *Phys. Rev. Lett*. 97, 047201 (2006).

BT-19. Effect of the magnetic impurity on the charge diffusion in highly dilute Ce doped $LaMnO_3$. G. Cabrera-Pasca[1], B. Bosch-Santos[2], A. Burimova[2], E. Correa[3] and *A.W. Carbonari*[2] *1. Faculdade de Ciências Exatas e Tecnologia, Universidade Federal do Pará - UFPA, Abaetetuba, Brazil; 2. CERPQ, Instituto de Pesquisas Energéticas e Nucleares - IPEN, São Paulo, Brazil; 3. Materials Science Laboratory, National Laboratory of Standards and Technology - NIST, Gaithersburg, MD, United States*

$LaMnO_{3+\delta}$ is a complex oxide, which, depending on the oxygen excess concentration δ, presents different crystalline structure and interesting magnetic and electric properties such as colossal magnetoresistance, polaron dynamics, multiferroic behavior, and charge-orbital ordering. This complexity requires different characterization techniques to draw a picture as complete as possible allowing a good understanding of these phenomena. Here, we have used the perturbed angular correlation (PAC) technique to measure hyperfine interactions at La and Mn sites of $LaMnO_{3+\delta}$ (δ ~0.15) using ^{140}Ce (at La sites) and ^{111}Cd (at both La and Mn sites) as probe nuclei in order to investigate within an atomic scale the magnetic and electric interactions in this compound. Results show that ^{111}Cd nuclei occupy quite high symmetric local sites in agreement with a rhombohedral structure. The magnetic hyperfine field (B_{hf}) measured with ^{111}Cd at La sites is very small (B_{hf} = 0.40 T) due to the supertransferred magnetic field from Mn neighbors through oxygen orbitals. On the other hand, ^{140}Ce nuclei at La sites present a saturation field of around 3.7 T much higher than that expected for La sites (due to the weak transfer field by superexchange mechanism). In addition, for temperature range above the magnetic ordering (200-300 K) a dynamic hyperfine interaction was observed characterized by the attenuation parameter λ(T) whose temperature dependence allowed to determine the activation energy (E_a) associated to the polaron diffusion, as displayed in Fig. 1.



BT-20. Magnetization dynamics of epitaxially grown manganite thin films on (001) oriented ferroelectric PMN-PT substrates. *S. Pati*[1], T. Usami[1] and T. Taniyama[1] *1. Department of Physics, Nagoya University, Nagoya, Japan*

Interfacial multiferroic materials comprising of a ferromagnetic (FM) and a ferroelectric (FE) layer have attracted great attention due to their interesting voltage controlled magnetic phenomena and its applicability in energy efficient spintronic devices [1,2]. Among FM oxides, perovskite manganites particularly $La_{1-x}Sr_xMnO_3$ (LSMO) have potential for a vast range of applications due to the unique properties such as half metallicity, i.e., high spin polarization, and high Curie temperature. In this work, we report on the static and dynamic magnetic properties of LSMO thin films epitaxially grown on (001) oriented ferroelectric (1-x)$Pb(Mg_{1/3}Nb_{2/3})O_3$-x$PbTiO_3$ (PMN-PT, with x=0.3). 100-nm-thick LSMO films were grown using a pulsed laser deposition technique equipped with a Nd:YAG laser of wavelength 266 nm at 650°C. XRD measurement confirms epitaxial growth of samples having out-of-plane lattice parameter c=3.843 Å. Temperature dependent magnetization shows that the Curie temperature, T_C, is around 355 K. In-plane magnetic anisotropy is confirmed from the M-H curve measurements, while the in-plane angular dependence of the remanence ratio reveals isotropic nature of the sample in the plane at room temperature. Room temperature