

Institut de Minéralogie et de Physique des Milieux Condensés
Unité Mixte de Recherche 7590
Code 115, 4 Place Jussieu F-75252 Paris CEDEX 05

SÉMINAIRE

Jeudi 26 septembre, 14h

*Salle de conférence, 4ème étage, Tour 22-23
IMPMC, Université P. et M. Curie, 4, Place Jussieu, 75005 Paris*

Adilson J.A. de OLIVEIRA

*Superconductivity and Magnetism Group – Physics Department
Federal University of São Carlos, São Carlos, SP – Brazil*

MAGNETIC AND ELECTRIC PROPERTIES OF MULTIFERROIC COMPOSITES

In recent years, composite materials made of piezoelectric and magnetostrictive phases have attracted considerable interest for their magnetoelectric (ME) coupling, which may lead to novel multifunctional devices. In these materials, the ME coupling depends upon phase equilibrium, magnitude of the magnetostriction and piezoelectric coefficients and electric resistivity.

In this talk, we present results of our group on the magnetoelectric and magnetostrictive characterization of multiferroic composites based on $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3$ (PMN-PT) as ferroelectric matrix and $\text{NiFe}_2\text{O}_4\text{-CoFe}_2\text{O}_4$ as ferromagnetic phase. In order to account for the data, we have developed a generalized model of the dependence of the magnetostriction on the magnetization for the 0-3 type composite material. We show that the model significantly improves the ordinary square magnetization model to account quantitatively for the dependence of both piezomagnetism and stress field on magnetostriction.