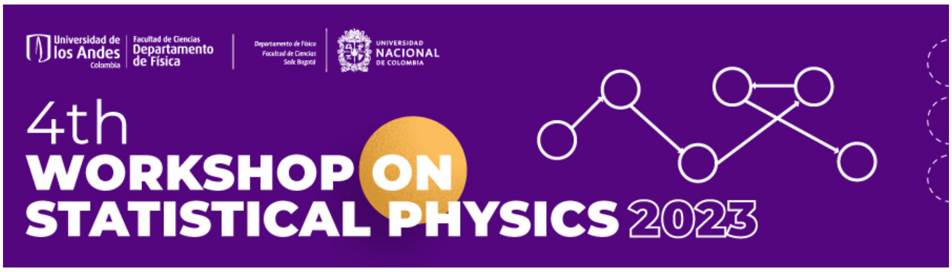

Contribution ID: **40** Tipo: **Poster**

Phase Separation Dynamics in Calcium and Praseodymium-Doped Manganites

jueves, 5 de octubre de 2023 17:40 (20 minutos)

Manganites consist of an alloy of manganese oxide (MnO_3) in conjunction with a rare-earth element (Lanthanum, Strontium, or Germanium). a particular case is Lanthanum manganite doped with praseodymium (LPCMO). This material holds significant interest due to their magnetic phase transitions occurring below temperatures of 130 K. One of the phenomena observed is the coexistence of ferromagnetic conducting and antiferromagnetic insulator phases, which varies depending on the doping level and temperature. An intriguing consequence of this phenomenon is the colossal magnetoresistance, where an abrupt change in electrical resistance with respect to the magnetic field is evident. The way these magnetic phases grows as a function of temperature follow nucleation and percolation processes via avalanches as in martensitic transformations. To assess these material properties, isothermal hysteresis curves are commonly employed to macroscopically identify the phases present.\newline

Nevertheless, to capture more detailed information about the material's properties, First Order Reversal Curves (FORC) are utilized. Here we used the FORC analysis to decombolute all magnetic interactions within the material. We also employed transport measurements (R vs T curves) combined with magnetization versus temperature measurements to pinpoint the precise temperature at which the phase transition occurs and the onsets of the percolation processes. Furthermore, our experimental results are reproduced using random-Ising model models, highlighting the significance of disorder and short-range interactions in the magnetic percolation processes. This underscores the role of disorder in shaping the material's magnetic behavior and its impact on phase transitions

Autores primarios: Mr AMAYA BOHORQUEZ, Joan Sebastian (Universidad de los Andes); Mr CARRANZA CELIS, Diego Andres (Universidad de los Andes); Prof. RAMIREZ ROJAS, Juan Gabriel (Universidad de los Andes)

Presentador: Mr AMAYA BOHORQUEZ, Joan Sebastian (Universidad de los Andes)

Session Classification: Poster session

Track Classification: Statistical Physics