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Low energy magnetic excitations in phase-separated La5/8 – yPryCa3/8MnO3 JAIME FERNANDEZ-BACA, FENG YE, SONGXUE CHI, WEI TIAN, ORNL, S-W CHEONG, Rutgers University — La5/8-yPryCa3/8MnO3 (LPCMO) ($y = 0.4$) is one of the prototype materials for the study of phase separation. The end members of the series, La5/8Ca3/8MnO3 and Pr5/8Ca3/8MnO3, have a robust low temperature FM metallic and charge ordered insulating states, respectively. Various experimental techniques have shown evidence of two-phase coexistence for intermediate Pr contents. However, a clear understanding of some basic macroscopic signature of phase separation is still lacking. The states of the coexistence phases are different when the system goes through different thermodynamic paths with the application of magnetic field. The zero-field-cooled (ZFC) procedure results in a dominant CO-OO state with little FM clusters at low temperature. Such insulating state is robust against external magnetic field. On the other hand, a zero-field cooled, field warming (ZFC-FW) procedure causes a sudden increase in FM intensity near the glassy transition temperature (TG $\sim$ 25K). In this talk we will present the results of recent elastic and inelastic neutron scattering experiments on a single crystal specimen of LPCMO, which reveal the nature of the complex phase coexistence at low temperatures.

Jaime Fernandez-Baca
ORNL

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