4T.16. THE MAGNETIC SPECTRA OF POLYCRYSTALLINE PEROVSKITE LSMO. Jihui Wang, Wenhao Qiao, Gang Ni, Youwei Du (Department of physics, Nanjing University, Nanjing, Jiangsu, 210093, China)

Dynamics of domains in the polycrystalline perovskite La$_1-x$Sr$_x$MnO$_3$ with $x=0.1, 0.15, 0.2, 0.3$ and $0.45$, was investigated by magnetic spectrum measurements in frequency from $10\,\text{Hz}$ to $100\,\text{MHz}$ at $77\,\text{K}$. The samples were prepared by sol-gel method, and the average grain size about 1.2µm after sintering at 1773K for 5h. A striking feature is found that the spectra consist of two dispersions as $x$ larger than 0.175 the composition of crystal structure transition from rhombohedral to orthorhombic, one is relaxation and the other is resonance, occurs at 57-135K and 49-55MHz, respectively. In contrast, only single resonance type dispersions are observed in the spectra with $x=0.1$ and 0.15. The relaxation and resonance as $x<0.175$ are attributed to domain wall displacements and spin rotations, and the damping of wall motions is mainly caused by eddy current in alternating field. However, the single resonance spectra with $x<0.175$ are supposed to be caused by spin rotations rather than coalescence of two dispersions relate to wall displacements and spin rotations, respectively, for the reason that the spins canted in the region $x=0.1-0.15$ so that the magnetic domain can not form.

4T.37. MAGNETIC AND MAGNETORESISTANCE STUDIES OF THE MANGANITES Sm$_{0.35}$Nd$_{0.65}$Pb$_{0.3}$Mn$_{1-x}$Co$_x$O$_3$ ($x = 0, 0.1, 0.2$). N. O. Moreno, J. C. P. Campoy, G. E. Barberis (UNICAMP, Instituto de Física “Gleb Wataghin”, Campinas, SP, 11083-970, Brazil) and J. I. Blanco, M. Insauti, T. Roje (UPV/EHU, Departamento de Química Inorgánica, Apdo. 544, Bilbao, 48080, Spain).

The magnetic behavior in polycrystalline samples of the Sm$_{0.35}$Nd$_{0.65}$Pb$_{0.3}$Mn$_{1-x}$Co$_x$O$_3$ ($x = 0, 0.1, 0.2$) at low magnetic fields has been studied by ac susceptibility, and field cooled (FC) and zero field cooled (ZFC) magnetization measurements. We conclude that a small amount of Co substitution tends to destroy the double exchange and broadens the coexistence region of the cluster-glass and ferromagnetic states. Also, the Co doping suppresses the large negative magnetoresistance and it becomes small for $x = 0.2$.

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4T.39. MAGNETIC PROPERTIES FOR La$_{0.8}$Ca$_{0.2}$MnO$_3$ FILMS AS A FUNCTION OF THICKNESS. Seung-il Park, Gaun Young Ahn, Young Suk Cho, Chul Sung Kim (Kookmin University, Department of Physics, Chongnong-dong, SongBuk-gu, Seoul, 136-702, South Korea) and In Bo Shim (Korea Institute of Science and Technology, Thin Film Technology Research Center, Chongnong-dong, SongBuk-gu, Seoul, Korea, 136-791, South Korea).

La-Ca-Mn-O films were deposited to various thickness(500, 750, 1000 and 1500 Å) by rf-magnetron sputtering at 700 °C on LaAlO$_3$(100) single crystal substrates. Deposited thin films were annealed for 1 hour in O$_2$ atmosphere at 800 °C. Microstructure, magnetic and low-field magnetoresistance properties and surface state of the deposited La-Ca-Mn-O films on single crystal substrates have been investigated with x-ray diffraction, Rutherford back-scattering spectroscopy, atomic force microscope, scanning electron microscope, magnetoresistance measurement. The rocking curve of the La-Ca-Mn-O films as a function of deposited thickness was indicated that La-Ca-Mn-O films were grown to planes parallel direction of LaAlO$_3$(100) substrate. The full width at half-maximum(FWHM) of the (200) peak was about 1.3° in all films on LaAlO$_3$(100), which indicates that some in-plane mosaic spread occurred in these epitaxial films. The crystal structure and chemical compositions of La-Ca-Mn-O films were determined to be perovskite orthorhombic structure with La$_{0.89}$Ca$_{0.11}$MnO$_3$. For film of 1000 Å, the lattice constant were $a_0 = 5.468Å$, $b_0 = 5.442Å$ and $c_0 = 7.393Å$. The temperature dependence of the resistance for 1500 Å shows that a semiconductor-metal transition, $T_{SC}$, occurs at 170 K. The relative maximum magnetoresistance, MR, defined as $R(R0)e=(R15kOe)/R(15kOe)$, is about 583 % at 150 K.

It is already well stablished that the substitution of the Mn ions by other elements considerably modifies the magnetic and transport properties in perovskite-like compounds. In this work the structural, magnetic and magnetotransport study of La$_{0.8}$Pb$_{0.2}$(Mn$_{0.9}$Fe$_{0.1}$)$_3$O$_7$ (TM=Fe, Co, Ni) GMR PEROVSKITES. A. Pena, J. Gutierrez, J. M. Barrandiaran, J. L. Pizarro, T. Rojo, M. Insauti, L. Lezama (Univ. del país Vasco/EHU, Facultad de Ciencias, Apartado 644, Bilbao, 48080, Spain)

FIG. 1. Magnetic field dependence of MR of sample with $x=0$. 

4T.35. STRUCTURE AND MAGNETISM IN (LaPb)(Mn$_{0.9}$TM$_{0.1}$)$_3$O$_7$ (TM=Fe, Co, Ni) GMR PEROVSKITES. A. Pena, J. Gutierrez, J. M. Barrandiarán, J. L. Pizarro, T. Rojo, M. Insauti, L. Lezama (Univ. del país Vasco/EHU, Facultad de Ciencias, Apartado 644, Bilbao, 48080, Spain)

It is already well stablished that the substitution of the Mn ions by other elements considerably modifies the magnetic and transport properties in perovskite-like compounds. In this work the structural, magnetic and magnetotransport study of La$_{0.8}$Pb$_{0.2}$(Mn$_{0.9}$TM$_{0.1}$)$_3$O$_7$ (TM=Fe, Co, Ni) manganites are presented. All compositions were synthesised using the sol-gel technique, and show a crystalline structure that corresponds to the trigonal (R-3c) space group. Both the Curie temperature and the saturation magnetic moment drop with the TM ion substitution. This effect is attributed to the disturbance of the double exchange interaction between Mn$^{3+}$ and Mn$^{4+}$ resonant valence ions, upon substitution by divalent ions. However, Ni has lower influence than Co and Fe in the magnetic properties. The magnetoresistance between 0 and 6 Tesla applied field has been also determined, with maximum values ranging between 45% and 65% for Ni and Fe substitution, respectively.

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