# EFFECT OF PRESSURE AND MAGNETIC FIELD ON CONDUCTIVITY AND MAGNETORESISTANCE IN La-Ca MANGANITES WITH EXCESS MANGANESE

**V. Mikhaylov[a], V.P. Dyakonov[a,b], E. Zubov[a], A.V. Pashchenko[a], V.N. Varyukhin[a], V. Shtaba[a], A. Szewczyk[b], A. Abal'oshev[b], K. Piotrowski[b], K. Dyakonov[c], S.J. Lewandowski[b], and H. Szymczak[b]**

[a]A.A. Galkin Physical-Technical Institute NASU, Donetsk 83114, Ukraine
[b]Institute of Physics PAS, 02-668 Warszawa, Poland
[c]A.F. Ioffe Physical-Technical Institute, St.Petersburg 194021, Russia

9.7 cm

The pressure, magnetic field and excess manganese effects on transport and magnetoresistance effect (MRE) have been studied in both the epitaxial films and bulk ceramics of manganites $(La_{0.7}Ca_{0.3})_{1-x}Mn_{1+x}O_{3-\delta}$ ($x$ = 0 - 0.2). The pressure and magnetic field effects are shown to increase with increasing manganese content. Experimental data show that the pressure and magnetic field effects on temperatures of both metal-insulator transition ($T_{MD}$) and MRE peak ($T_{MR}$) are considerably stronger in the films than in ceramics. The hydrostatic pressure increases $T_{MD}$ and $T_{MR}$. MRE for both types of samples was shown to be favored by the pressure and magnetic field in an opposite way. A direct correlation is established between $T_{MD}$ and conductivity bandwidth as well as between MRE and concentration of charge carriers at applied pressure. The origin of pressure-magnetic field effects is analyzed in the frame of double exchange interaction and small polaron hopping and variable range hopping models.
This work was in part supported by the Polish Government Agency KBN (Project 1 P03B 025 26) and by the RFBR (Grant No. 04-02-17598).

13.4 cm

**Subject category :**

4. Rare Earths and Actinides, Alloys and Compounds

**Presentation mode :**
poster

**Corresponding author :**
K. Dyakonov

**Address for correspondence :**
A.F. Ioffe Physical-Technical Institute
Politekhnicheskaya 26
194021 St.Petersburg, Russia

**Email address :**
k.dyakonov@mail.ioffe.ru