# Effect of epitaxial strain on electronic and magnetic properties in $NdNiO_3$ thin films

A. Stupakov,[1] O. Pacherová,[1] M. Jelínek,[1] and M. Tyunina[2,1]

[1] *Institute of Physics CAS, Prague, Czech Republic*

[2] *Microelectronics Research Unit, University of Oulu, Finland*

The (20-100)-nm-thick films of $NdNiO_3$ were grown by pulsed laser deposition. The (001) LSAT and LAO were used as substrates providing biaxial strain of +1.5% and -0.4%, respectively. The obtained resistivity values and temperatures of metal-to-insulator transition (MIT) of the thin films is consistent with the lowest reported values. E.g. for the films on LAO, the transition temperature for the thickest film was 100 K, whereas the thin films demonstrated a fully metallic behavior.

An intriguing observation was made under magnetic field applied in the out-of-plane direction of the films. All films demonstrated a pronounced negative magneto-resistance at low temperatures: resistivity drop reached 4-7% at the temperature of 2 K and the field of 9 T. The resistivity drop decreased rapidly on heating until its complete disappearance at 20-50 K. We relate such magneto-resistance behavior to a transition from the low-temperature antiferromagnetic phase to the high-temperature paramagnetic state. The observed resistivity, MIT, magneto-resistance and magnetization behavior will be discussed in terms of lattice strain and strain relaxation across the thickness of the films.