## CMR effect in $La_{1-x}Sr_xMnO_3$ nanowire networks

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We fabricated nanowire networks of $La_{1-x}Sr_xMnO_3$ with different doping levels *x* via electrospinning [1] and a subsequent thermal treatment. Scanning electron microscopy revealed an average diameter of the resulting nanowires of around 220 nm and a length of more than 50 μm, forming the network structure with numerous interconnects. The individual nanowires are polycrystalline with a grain size of about 15-20 nm, as observed by transmission electron microscopy.

Analyses of the electronic transportation properties and of the magnetoresistive effects of the nanowire networks were carried out by four-probe measurements in external magnetic fields up to 10 T, in order to investigate the high-field magnetoresistance behavior which sheds light on the influence of the sample microstructure via the interface response [2]. SQUID measurements of *M(T)* and *M(H)* were carried out as well, revealing the soft magnetic character of the nanowires.

We employed the transmission electron-backscattering diffraction (t-EBSD) technique [2] to obtain details on the grain and grain boundary arrangement within an individual nanowire. The t-EBSD technique allows a proper analysis of samples with nanometer-sized grains. The grains are oriented randomly as indicated by the large amount of grain boundaries with high misorientation angles.

**References**

[1] Ll. Balcells, et. al, Phys. Rev. B 58, R14697 (1998).
[5] P. W. Trimby, Ultramicroscopy 120, 16 (2012).