Giant magnetoresistance and Shubnikov–de Haas effect in LuSb

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Lanthanum monopnictides have recently been proposed as materials with non-trivial topology of their electronic structures [1,2]. Motivated by this conjecture and our previous work on YSb [3], we investigated single-crystals of another isostructural compound, viz. LuSb, by means of electrical resistivity, magnetoresistance and Hall effect measurements. We discovered giant magnetoresistance exceeding 3000 %, low-temperature resistivity plateau, and strongly angle-dependent Shubnikov–de Haas oscillations. The compound was characterized as a semimetal with nearly balanced contributions of electron and hole carriers to the magnetotransport properties. The experimental findings were supported by the results of our first-principle electronic structure calculations. We conclude that the magnetotransport in LuSb can be described in the scope of 3D multi-band Fermi surface model without topologically non-trivial electronic states.

— *Work supported by the National Science Centre (Poland); grant no. 2015/18/A/ST3/00057.* —

References:

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