Low temperature 2D quantum corrections to magnetoconductance in thin iridate films

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2025

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Keywords: Sheet resistance, magnetoresistance, conductivity, 2D quantum corrections.

Abstract: The sheet resistance of the thin epitaxial SrIrO3 films shows the monotonic decrease with temperature raise in the low temperature range of 1.86–30.0 K and the negative magnetoresistance at 2 and 10 K in magnetic fields of up to 10 T. For a correct description of the observed behavior, the model of 2D quantum corrections to the conductivity due to the spin splitting, Coulomb interaction, and weak localization effects was applied. It was shown that the negative total magnetoresistance was originated from the corrections due to the Coulomb interaction and spin-orbital splitting to weaken the spin-orbital scattering contribution in addition to the weak localization suppression and to the presence of the electron attraction induced by phonons.

Publication source: Low temperature 2D quantum corrections to magnetoconductance in thin iridate films / A. L. Danilyuk, D. A. Podryabinkin, A. B. Filonov [et al.] // Solid State Communications. – 2025. – Vol. 406. – P. 116220. – DOI: 10.1016/j.ssc.2025.116220.