

Abstract Submitted
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Hall effect induced by electron-surface scattering on thin gold films deposited on preheated mica substrates under high vacuum¹ RAUL MUNOZ, JUAN PABLO GARCIA, RICARDO HENRIQUEZ, ANA MARIA MONCADA, GERMAN KREMER, LUIS MORAGA, SIMON CANCINO, MIGUEL CHESTA, PEDRO MIRANDA, JOSE ROBERTO MORALES, Department of Physics, Univ. of Chile — We report the first measurement of the Hall effect where the signal can be unequivocally attributed to electron-surface scattering. The measurement of both the Hall effect and the resistivity of the samples was carried out on a family of 4 gold films (thickness of 69 nm, 93 nm, 150 nm and 185 nm) evaporated onto preheated mica substrates under high vacuum. The experiment was performed at low temperatures T ($4\text{K} \leq T \leq 50\text{K}$) under high magnetic field strengths \mathbf{B} ($1.5\text{ T} \leq B \leq 9\text{ T}$), with \mathbf{B} oriented perpendicular to the films. The Hall tangent E_y/E_x turns out to depend on film thickness, as predicted by Sondheimer [E. H. Sondheimer, Pys. Rev. **80** (1950) 401; Adv. Phys. **1** (1952) 1] and by Calecki [D. Calecki, Phys. Rev. **B42** (1990) 6906]. However, both Sondheimer's and Calecki's model fail to describe the temperature as well as the thickness dependence of both the resistivity of the films and of the Hall tangent. Work funded by FONDECYT 1040723.

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