

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Size effects in thin gold films: Discrimination between electron-surface and electron-grain boundary scattering by measuring the Hall effect at 4 K¹ RAUL C. MUNOZ, Department of Physics, University of Chile, R. HENRIQUEZ, Department of Physics, Universidad Santa Maria, L. MORAGA, G. KREMER, M. FLORES, A. ESPINOSA, Department of Physics, University of Chile — We report the Hall effect measured in gold films evaporated onto mica substrates, the samples having an average grain diameter D that ranges between 12 and 174 nm, and a thickness t of approximately 50 nm and 100 nm. The Hall mobility was determined at low temperatures T ($4\text{K} \leq T \leq 50\text{K}$). By tuning the grain size during sample preparation, we discriminate whether the dominant collision mechanism controlling the resistivity of the samples at 4 K is electron-surface or electron-grain boundary scattering, based upon whether the Hall mobility depends linearly on film thickness t or on grain diameter D .

References:

R. Henriquez et al, Appl. Phys. Lett. **102** (2013) 051608.

¹Funding from FONDECYT 1120198 is gratefully acknowledged

Raul C. Munoz
Department of Physics, University of Chile

Date submitted: 11 Nov 2013

Electronic form version 1.4