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Scaling of thermoelectric voltage induced by microwave radiation at the boundary between two-dimensional electron systems N. ROMERO KALMANOVITZ, I. HOXHA, Y. JIN, S.A. VITKALOV, M.P. SARACHIK, Physics Dept., City College of the City Univ. of New York, I.A. LARKIN, International Center of Condensed Matter Physics, Brasilia, T.M. KLAPWIJK, Delft Univ. of Technology, Dept. of Applied Physics — We report measurements of the rectification of microwave radiation (0.7-20 GHz) at the boundary between two- dimensional electron systems created by a narrow gap split gate on a silicon surface for different temperatures, electron densities and microwave power. For frequencies above 4 GHz and different temperatures, the rectified voltage V_{dc} as a function of microwave power P can be collapsed onto a single universal curve $V_{dc}^{*} = f^{*}(P^{*})$ using two scaling parameters. The scaled voltage, V_{dc}^{*}, is a linear function of power, P^{*}, for small power and proportional to $(P^{*})^{1/2}$ at higher power. A theory is developed which attributes the observed voltage to the thermoelectric response associated with local heating by the microwave radiation of adjacent two-dimensional electron systems with different densities n_1 and n_2. Excellent quantitative agreement is obtained between theory and experiment. *The work at the City College of New York was supported by DOE grant DOE-FG02-84-ER45153. The work at International Center of Condensed Matter Physics, Brasilia, was supported by IBEM fund from Brazilian Ministry of Science and Technology.

Natalia Romero Kalmanovitz
CUNY-CCNY

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