## Abstract Submitted for the MAR16 Meeting of The American Physical Society

Universality of Effective Medium and Random Resistor Network models for disorder-induced linear unsaturating magnetoresistance<sup>1</sup> SILVIA LARA, YING TONG LAI, CAMERON LOVE, Yale-NUS College, NAVNEETH RAMAKRISHNAN, Department of Physics and Centre for Advanced 2D Materials, National University of Singapore, SHAFFIQUE ADAM, Yale-NUS College — In recent years, the Effective Medium Theory (EMT) [1] and the Random Resistor Network (RRN) [2] have been separately used to explain disorder induced magnetoresistance that is quadratic at low fields and linear at high fields. We demonstrate that the quadratic and linear coefficients of the magnetoresistance and the transition point from the quadratic to the linear regime depend only on the inhomogeneous carrier density profile. We use this to find a mapping between the two models using dimensionless parameters that determine the magnetoresistance and show numerically that they belong to the same universality class. [1] J. Ping, I. Yudhistira, N. Ramakrishnan, S. Cho, S. Adam, and M. S. Fuhrer, Phys. Rev. Lett. 113, 047206 (2014). [2] M. Parish and P. Littlewood, Nature 426, 162 (2003)

<sup>1</sup>This work is supported by the Singapore National Research Foundation (NRF-NRFF2012-01) and the Singapore Ministry of Education and Yale-NUS College through grant number R-607-265-01312.

Silvia Lara Yale-NUS College

Date submitted: 06 Nov 2015 Electronic form version 1.4