Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Strong-disorder renormalization group study of the Anderson localization transition in three and higher dimensions HOSSEIN JAVAN MARD, VLADIMIR DOBROSAVLJEVIĆ, National High Magnetic Field Laboratory, Florida State University, JOSÉ A. HOYOS, Instituto de Física de São Carlos, Universidade de São Paulo, EDUARDO MIRANDA, Universidade Estadual de Campinas(Unicamp), SP, Brazil — We implement an efficient strong-disorder renormalization group (SDRG) procedure[1] for disordered tight-binding models in dimension $D \geq 3$, including the localization properties on Erdős-Rényi random graphs, which represent an appropriate infinite dimensional limit. Our dramatically improved SDRG algorithm is based on a judicious elimination of most (irrelevant) new bonds generated under RG. It yields excellent agreement with exact numerical results for universal properties at the critical point, without significant increase of the required computer time, even as the spatial dimension is increased beyond $D = 3$. This opens an efficient avenue to explore the critical properties of Anderson transition in the strong-coupling limit of high spatial dimensions.

[1]H. Javan Mard, José A. Hoyos, E. Miranda, V. Dobrosavljević, *Strong-disorder renormalization-group study of the one-dimensional tight-binding model* , Phys. Rev. B 90, 125141(2014).

Hossein Javan Mard
National High Magnetic Field Laboratory, Florida State University

Date submitted: 14 Nov 2014 Electronic form version 1.4