

Abstract Submitted  
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**Large Disorder Renormalization Group Study of Singularities in the Insulating Phase of the Anderson Model of Localization**<sup>1</sup> SONIKA JOHRI, Department of Electrical Engineering, Princeton University, Princeton NJ 08544-5263, R.N. BHATT, Department of Electrical Engineering and Princeton Center for Theoretical Science, Princeton University, Princeton NJ 08544-5263 — A recent study<sup>2</sup> of Anderson's 1958 model of localization<sup>3</sup> reveals singular behavior of electronic eigenstates, as displayed by the density of states and inverse participation ratio, as a function of energy. This behavior occurs inside the insulating phase and separates typical Anderson localized from rare configuration, resonant Lifshitz states. Here, we use the large disorder renormalization group (LDRG) approach to study this problem. In particular, we study, using the LDRG approach, how the singular behavior evolves as a function of system size, starting from a toy model with two-sites which can be solved analytically. We assess the accuracy of the LDRG approach in obtaining the singular behavior in the thermodynamic limit for different disorder strengths, by comparing with results obtained by exact numerical diagonalization.

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<sup>2</sup>S. Johri, R.N. Bhatt, arXiv:1106.1131v2

<sup>3</sup>P. W. Anderson, Physical Review **109**, 1492 (1958).

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