Phase transition in the Integrated Density of States of the Anderson model arising from a supersymmetric sigma model

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Abstract

Localization/delocalization transition in random Schrödinger operators cannot in general be seen from the behavior of the corresponding Integrated Density of States (IDS). Here we consider a random Schrödinger operator appearing in the study of certain reinforced random processes in connection with a supersymmetric sigma-model, and show that the IDS undergoes a phase transition between weak and strong disorder regime in dimension larger or equal to three. This transition follows from a phase transition in the corresponding random process and supersymmetric sigma-model.