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Numerical Real Space Renormalization of a 2D Random Boson Model SHANKAR IYER, GIL REFAEL, California Institute of Technology — Interest in the random boson problem originated in experiments on Helium adsorbed in Vycor, but the problem arises in many contexts, including Josephson junction arrays and disordered cold atom systems. Recently, Altman, Kafri, Polkovnikov, and Refael have studied a rotor model description of interacting bosons subjected to quenched disorder in one dimension. Using a real space renormalization approach, they have identified a random fixed point that marks the transition between superfluid and Mott-glass phases. Here, we describe work that numerically extends their approach to the random boson problem in two dimensions. We first test the validity of the real space renormalization by comparison to exact diagonalization of small systems. Then, we move to larger systems and explore what the renormalization scheme can tell us about the nature of the insulating and superfluid phases.

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