

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Disordered bosons in one dimension: from weak to strong randomness criticality¹ FAWAZ HRAHSEH, THOMAS VOJTA, Missouri University of Science and Technology — We investigate the superfluid-insulator quantum phase transition of one-dimensional bosons with off-diagonal disorder by means of large-scale Monte-Carlo simulations. For weak disorder, we find the transition to be in the same universality class as the superfluid-Mott insulator transition of the clean system. The nature of the transition changes for stronger disorder. Beyond a critical disorder strength, we find nonuniversal, disorder-dependent critical behavior. We compare our results to recent perturbative and strong-disorder renormalization group predictions. We also discuss experimental implication as well as extensions of our results to other systems.

¹This work has been supported by the NSF under Grant Nos. DMR-0906566 and DMR-1205803.

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Date submitted: 19 Oct 2012

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