

Bose condensation in (random) traps

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We study a condensation of the perfect Bose-gas in the presence of random external potentials. It is shown that a generalised condensation (*à la* van den Berg-Lewis-Pulé) in the one-particle random eigenstates occurs *if and only if* it implies the occupation of one-particle kinetic-energy eigenstates corresponding to the generalised condensation in the free Bose-gas. We also prove that the amounts of the both condensate densities are *equal*. Our method is based on an explicit estimate of the particle occupation measure in the one-body kinetic-energy eigenstates for non-interacting disordered boson systems. It allows also to re-examine the properties of the perfect Bose-gas in the presence of the *scaled* random and non-random traps, for which we prove the similar results.