

## BEC FOR LOW DIMENSIONAL INTERACTING BOSONS

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The theory of ultracold, dilute Bose gases is the subject of intensive studies, driven by new experimental applications, which also motivate the study of BEC in low dimensions. From the theoretical point of view there are few -quite special- models in which we are able to prove BEC for interacting bosons. With the aim of studying the condensation problem I will consider a simplified model for a two dimensional system of bosons interacting with a repulsive short range potential, obtained introducing an ultraviolet momentum cutoff. I will prove that the interacting theory is well defined at all orders in terms of an effective parameter related to the intensity of the interaction and that the correlations do not exhibit anomalous dimensions, i.e. the model is in the same universality class of the exactly soluble Bogoliubov model. The result is obtained using rigorous renormalization group techniques and implementing local Ward identities (WI), which reduce the number of independent running couplings, this fact being crucial for the control of the two dimensional theory, where the effective interactions are relevant. Since the ultraviolet momentum cutoff breaks local gauge invariance, the corrections to the formal WI have been considered. Joint work with A.Giuliani.