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Large N model of bose gases KE KE, LEO RADZIHOVSKY, University of Colorado at Boulder — We construct the large N model of bose gases. Using an artificial parameter 1/N to do the perturbative analysis to study two models: $U(N)$ bose gases and $U(1) \times O(N)$ bose gases. We find that for the U(N) model we get the same Bogoliubov spectrum and LHY thermal dynamical relations with ordinary bose gases. For the $U(1) \times O(N)$ model, however, we calculate dispersion relation, chemical potential and free energy when N goes to infinity and find that every quantities depends on the ration of two scattering length and $\sqrt{(na^3)}$.

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