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Invariant measures for nonlinear Schroedinger equations as limit of many body quantum states.

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We prove that Gibbs measures of nonlinear Schroedinger equations of Hartree-type arise as high-temperature limit of appropriately modified thermal states in many-body quantum mechanics. In dimensions d=2,3 these Gibbs measures are supported on singular distributions and Wick ordering of the interaction is necessary. Our proof is based on a perturbative expansion in the interaction, organised in a diagrammatic representation, and on Borel resummation of the resulting series. This is a joint work with J. Froehlich, A. Knowles and V. Sohinger.

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