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Thomas Chen and **Natasa Pavlovic***, Department of Mathematics, University of Texas at Austin, 1 University Station, C 1200, Austin, TX 78712. *A new derivation of the Gross-Pitaevskii Hierarchy.*

The Gross-Pitaevskii (GP) hierarchy is an infinite system of coupled linear non-homogeneous PDEs, which appear in the derivation of the nonlinear Schrödinger equation (NLS). In this talk we will discuss a new derivation of the defocusing cubic GP hierarchy in dimensions $d = 2, 3$, from an N -body Schrödinger equation describing a gas of interacting bosons in the GP scaling, in the limit $N \rightarrow \infty$. In particular, we prove convergence of the corresponding BBGKY hierarchy to a GP hierarchy in the spaces introduced in our previous work on the well-posedness of the Cauchy problem for GP hierarchies, which are inspired by the solutions spaces based on space-time norms introduced by Klainerman and Machedon. We note that in $d = 3$, this has been a well-known open problem in the field. While our results do not assume factorization of the solutions, consideration of factorized solutions yields a new derivation of the cubic, defocusing NLS in $d = 2, 3$. (Received December 13, 2011)