

OPTIMAL LOCAL WELL-POSEDNESS FOR THE DERIVATIVE NONLINEAR SCHRÖDINGER EQUATION

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In joint work with Andrea Nahmod and Haitian Yue, we prove local well-posedness for the derivative nonlinear Schrödinger equation in Fourier-Lebesgue space which has the same scaling as H^s for any $s > 0$. This closes the gap left open by the work of Grunrock-Herr where $s > 1/4$. Here there is no trilinear estimate in any standard function space, instead we will construct the solution in a nonlinear submanifold (of a function space) by exploiting its structure. This is somehow inspired by the theory of para-controlled distributions that Gubinelli et al. developed for stochastic PDEs, but our arguments are purely deterministic.