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Morawetz type inequalities and improved global well-posedness for the quintic NLS in 1d

Morawetz type estimates are monotonicity formulae that take advantage of the momentum conservation law of the nonlinear Schrödinger equation (NLS), and have been used extensively in obtaining global well-posedness and scattering results. By using an interaction Morawetz inequality for an "almost solution" of the NLS we prove a local-in-time $L_t^6 L_x^6$ bound. We use this bound along with the "I-method" to prove a new global well-posedness result for the quintic NLS in 1d.

This is joint work with D. De Silva, N. Pavlovic and G. Staffilani.