

Unconditional uniqueness for nonlinear dispersive equations

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Abstract

When a solution to the Cauchy problem for a nonlinear evolution equation is obtained by a fixed point argument using auxiliary function spaces, uniqueness of solutions in a natural space (e.g., space of continuous functions with values in the same Banach space as initial data), which we call unconditional uniqueness, becomes a non-trivial property, and to show that often requires some additional work. Recently, unconditional uniqueness for some nonlinear dispersive equations such as the Korteweg-de Vries equation and nonlinear Schrödinger equations has been shown in the periodic setting by a simple integration by parts argument, which can be regarded as a variant of the normal form reduction. In this talk, we review some results in this direction and introduce an abstract framework, and then apply it to some of specific nonlinear dispersive equations.