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# Validity of the KdV and the NLS approximation for the water wave problem

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## Abstract

Many mathematical models for hydrodynamic problems are so complicated that a qualitative understanding of the solutions to the full problems usable for practical applications does not seem within reach for the near future, neither analytically nor numerically. Therefore, it is reasonable to approximate these models in various parameter regimes by appropriate reduced models whose qualitative properties are more easily accessible. To understand to which extent these reduced models yield correct predictions of the behavior of the original problems it is important to justify the validity of these approximations by estimates of the approximation errors in the typical length and time scales.

In this talk, we discuss mathematically rigorous justifications of the approximations of the water wave equations by the Korteweg-de Vries equation and the Nonlinear Schrödinger equation.

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