

Gulcin Muslu.

Título: Long time behavior of solutions to the generalized Boussinesq equation in Sobolev spaces

Abstract: In this talk, we focus on the generalized Boussinesq equation to model the water wave problem with surface tension. First we investigate the initial value problem in the Sobolev spaces. We derive some conditions under which the solutions of this equation are global or blow-up in time. The non-existence of solitary waves for some parameters are proved using Pohozaev type identities. We generate solitary wave solutions of generalized Boussinesq equation using the Petviashvili iteration method numerically. In order to investigate time evolution of solutions to the generalized Boussinesq equation, we propose the Fourier pseudo-spectral numerical method. After studying the time evolution of the single solitary wave, we focus on the gap interval where neither a global existence nor a blow-up result has been established theoretically. Our numerical results successfully fill the gaps left by the theoretical ones.

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