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**Wave breaking phenomena and stability of peakons for the Degasperis-Procesi equation**

ABSTRACT:

In this talk I will discuss some recent progress concerning with the Degasperis-Procesi equation, which can be derived as a member of a one-parameter family of asymptotic shallow-water wave approximations to the Euler equations with the same asymptotic accuracy as that of the Camassa-Holm equation. I will focus on some of my recent results including wave breaking phenomena, blow-up structure, global weak solutions and the orbital stability of the peaked solitons. Moreover, I will talk about some applications of the Degasperis-Procesi equation, for example, the short-wave equation.