

Weak solution for stochastic Degasperis-Procesi equation

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This work is concerned with the existence of solution to the stochastic Degasperis-Procesi equation with an infinite dimensional multiplicative noise and integrable initial data. Writing the equation as a system composed of a stochastic nonlinear conservation law and an elliptic equation, we are able to develop a method based on the conjugation of kinetic theory with stochastic compactness arguments. More precisely, we apply the stochastic Jakubowski-Skorokhod representation theorem to show the existence of a weak kinetic martingale solution. In this framework, the solution is a stochastic process with sample paths in Lebesgue spaces, which are compatible with peakons and wave breaking physical phenomenon.

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