

Yin, Zhaoyang

On the Cauchy problem for an integrable equation with peakon solutions. (English)

Zbl 1061.35142

Ill. J. Math. 47, No. 3, 649-666 (2003).

The non-linear family of partial differential equations,

$$u_t + c_0 u_x + \gamma u_{xxx} - \alpha^2 u_{txx} = (c_1 u^2 + c_2 u_x^2 + c_3 u u_{xx})_x,$$

contains the Korteweg-de Vries and the Camassa-Holm equations as particular cases. These two equations are considered “integrable”, because for some boundary conditions they can be solved using linear methods. Another differential equation in this family with similar “integrability” properties is

$$u_t - u_{txx} + 4uu_x = 3u_x u_{xx} + uu_{xxx}.$$

The paper under review studies the Cauchy problem for the above equation.

Reviewer: [Juan J. Morales-Ruiz \(Barcelona\)](#)

MSC:

35Q58 Other completely integrable PDE (MSC2000)

37K40 Soliton theory, asymptotic behavior of solutions of infinite-dimensional Hamiltonian systems

35G25 Initial value problems for nonlinear higher-order PDEs

35L05 Wave equation

Cited in **139** Documents

Keywords:

Cauchy problem; integrable evolution equations; Korteweg-de Vries equation; Camassa-Holm equation