

Classical Solutions of the Generalized Camassa-Holm equation

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ABSTRACT

In this presentation, well-posedness in $C^1(\mathbb{R})$ (a.k.a. classical solutions) for a generalized Camassa-Holm equation (g - kb CH)

$$\begin{cases} (1 - \partial_x^2)\partial_t u = u^k \partial_x^3 u + bu^{k-1} \partial_x u \partial_x^2 u - (b+1)u^k \partial_x u, \\ u(x, 0) = u_0(x), \quad x \in \mathbb{R} \text{ and } t \in \mathbb{R}, \end{cases} \quad (0.1)$$

having $(k+1)$ -degree nonlinearities is shown. This result holds for the Camassa-Holm, the Degasperi-Procesi and the Novikov equations, which improves upon earlier results in Sobolev and Besov spaces.