A FINITE DIFFERENCES SCHEME FOR A CAMASSA-HOLM TYPE EQUATION.

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Abstract. A finite differences scheme for a Camassa-Holm type equation will be presented. In particular, we will find approximate solutions for the Cauchy problem

$$\begin{cases} u_t - 2u_{xxt} + u_{xxxxt} = -3uu_x + 4uu_{xxx} - uu_{xxxxx} + 5u_xu_{xx} \\ \qquad\qquad\qquad\qquad -2u_xu_{xxxx} - 6u_{xx}u_{xxx} + 2u_{xxx}u_{xxxx} + u_{xx}u_{xxxxx}, \\ u(x,0) = u_0(x). \end{cases} \tag{1}$$

The equation was first proposed by Qiao and Reyes in [2], and it is a variation of the original Camassa-Holm equation first proposed in [3], which is a dispersive shallow water equation that possess special soliton solutions known as *peakons*.

In this talk, the numerical scheme will be presented, along with a preview of some of its properties and numerical examples of its performance.

Keywords: Finite difference scheme, Camassa-Holm equation, hyperbolic-elliptic system.

Mathematics Subject Classifications (2010): 35G25, 35L05, 65M06, 65M12

References

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