Global analyticity for a generalized Camassa-Holm equation and decay of the radius of spatial analyticity

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Abstract

Global analytic solution in both the time and space variable is presented for the Cauchy problem af a generalized Camassa-Holm equation, which contains as its members two integrable equations, namely the Camassa-Holm and Novikov equations. The main assumptions are that the initial datum $u_0(x)$ is analytic on the line, it has uniform radius of analyticity $r(0) > 0$, and it is such that the Mckean quantity $m_0(x) \doteq (1 - \partial_x^2)u_0(x)$ does not change sign. Furthermore, an explicit lower bound on the radius of space analyticity at later times is given.

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