

A Riemann–Hilbert approach to the modified Camassa–Holm equation with nonzero boundary conditions

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Abstract. We develop the Riemann–Hilbert problem approach to the modified Camassa–Holm (mCH) equation in the case when the solution is assumed to approach a non-zero constant at the both infinities of the space variable. In this case, the spectral problem for the associated Lax pair equation has a continuous spectrum, which allows formulating the inverse spectral problem as a Riemann–Hilbert factorization problem with jump conditions across the real axis. We obtain a representation for the solution of the Cauchy problem for the mCH equation and also a description of certain soliton-type solutions, both regular and non-regular.

This is joint work with Anne Boutet de Monvel and Dmitry Shepelsky.

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