The conservative Camassa–Holm flow with decaying initial data

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Abstract. The Camassa–Holm equation is the nonlinear PDE

$$u_t - u_{xxt} = 2u_x u_{xx} - 3uu_x + uu_{xxx}, \tag{1}$$

which has been derived as a model for unidirectional wave propagation on shallow water. We will solve the associated Cauchy problem for decaying initial data by solving an inverse spectral problem for an indefinite Sturm–Liouville problem.