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Rigorous asymptotics of the soliton gas

We analytically study the long time and large space asymptotics of a KdV soliton gas. A soliton gas can be thought as an infinite collection of interacting solitons randomly distributed on the line. The concept was originally introduced by Zakharov (1971). From a 2×2 Riemann-Hilbert problem and via non-linear steepest descent techniques, we are able to extract meaningful information for the solution of the KdV equation in such (random) setting. This is a joint work with Ken McLaughlin (CSU).