Mathematics > Analysis of PDEs

The Gardner equation and the stability of multi-kink solutions of the mKdV equation

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Multi-kink solutions of the defocusing, modified Korteweg-de Vries equation (mKdV) found by Grosse are shown to be globally H^1-stable. Stability in the one-kink case was previously established by Zhidkov, and Merle-Vega. The proof uses transformations linking the mKdV equation with focusing, Gardner-like equations, where stability and asymptotic stability in the energy space are known. We generalize our results by considering the existence, uniqueness and the dynamics of generalized multi-kinks of defocusing, non-integrable gKdV equations, showing the inelastic character of the 4-kink collision in some regimes.

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