Wave fronts and soliton webs – exact solutions of the 2D Volterra system.

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Abstract:

Two dimensional periodic Volterra system (with the period $N \geq 3$) has an interesting and rather unusual set of exact soliton solutions. In particular, it has wave front solutions, which represent non-stationary interfaces between non-linear periodic waves of different periods.

Another class of exact soliton solutions in the space-time domain looks like a web of solitons. We compare multi-soliton solutions of rank one with one soliton solutions of higher rank. The famous Kadomtsev-Petviashvili equation is a continuous limit $(N \to \infty)$ of the two dimensional Volterra system.