

Nonlinear sine-Gordon soliton waves and acoustic shock waves

by

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During the many years of collaboration with Yuri Gaididei a rather broad spectrum of problems had been investigated. Gaididei's broad interest and deep knowledge were great inspiration for our research in the nonlinear dynamics group at the Technical University of Denmark. In the current presentation this is illustrated by our joint work on sine-Gordon magnetic fluxons in curved Josephson junctions [1] and acoustic shock waves [2]. Focus is on approximate analytical results for sine-Gordon kink solitons and acoustic shock waves combined with numerical simulations. Pattern similarities between oscillating shocks and oscillating Josephson fluxons are discussed.

[1] Gorria, C., Gaididei, Y. B., Sørensen, M. P., Christiansen, P. L., and Caputo, J. G. (2004). Kink propagation and trapping in a two-dimensional curved Josephson junction. *Physical Review B*, 69(13), 134506.

[2] Gaididei, Y., Rasmussen, A. R., Christiansen, P. L., and Sørensen, M. P. (2016). Oscillating nonlinear acoustic shock waves. *Evolution Equations & Control Theory*, 5(3), 367.