Asymptotic stability of kinks in the odd energy space

Michał Kowalczyk
Universidad de Chile, Chile
kowalczy@dim.uchile.cl

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In this talk I will first present a 10 years old result about the asymptotic stability of the kink in the classical ϕ^4 model under the assumption of oddness of the initial perturbations. I will explain how the problem can be decomposed into radiation and internal modes and how the components can be controlled through virial estimates. This result depends on some numerical approximations and its proof can be viewed as computer assisted. Recently, we were able to generalize the asymptotic stability result to one dimensional scalar field models with one internal mode. I will show how using the Darboux factorization of the linearized operator around the kink one can avoid numerical approximations.