

On Global Attraction to Quantum Stationary States

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We consider the Klein-Gordon equation coupled to $U(1)$ -invariant nonlinear oscillators. The solitary waves of the coupled nonlinear system form two-dimensional submanifold in the Hilbert phase space of finite energy solutions. Our main results read as follows:

Theorem

Let all the oscillators be strictly nonlinear. Then any finite energy solution converges, in the long time limit, to the solitary manifold in the local energy seminorms.

The investigation is inspired by Bohr's postulates on transitions to quantum stationary states. The results are obtained for:

- 1D KGE coupled to one oscillator [1,2,3];
- 1D KGE coupled to finite number of oscillators [4];
- nD KGE coupled to one oscillator via mean field interaction [5].

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[3] A.I. Komech, A.A. Komech, Global attractor for a nonlinear oscillator coupled to the Klein-Gordon field, *Arch. Rat. Mech. Anal.* **185** (2007), 105-142.

[4] A.I. Komech, A.A. Komech, On global attraction to solitary waves for the Klein-Gordon field coupled to several nonlinear oscillators, submitted to *J. des Mathematiques Pures et App.*, 2009.

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