

ATTRACTORS FOR THE KLEIN-GORDON-SCHRODINGER EQUATION WITH BOUNDARY TERM

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ABSTRACT. (Joint work with Keonhee Lee)

We investigate the existence of a global attractor for Klein-Gordon-Schrodinger system with boundary term. This model is concerned with a complex-valued function ψ and a real-valued function ϕ and takes the form

$$\begin{aligned}i\psi_t + \Delta\psi + i\nu\psi + \phi\psi &= f(x) \text{ in } Q = \Omega \times (0, \infty), \\ \phi_{tt} - \Delta\phi + \phi + \gamma\phi_t &= |\psi|^2 + g(x) \text{ in } Q = \Omega \times (0, \infty), \\ \psi &= 0 \text{ on } \Sigma = \Gamma \times (0, \infty), \\ \phi &= 0 \text{ on } \Sigma_0 = \Gamma_0 \times (0, \infty), \\ \frac{\partial\phi}{\partial\eta} + \beta\phi &= 0 \text{ on } \Sigma_1 = \Gamma_1 \times (0, \infty),\end{aligned}$$

$$\psi(x, 0) = \psi_0(x), \phi(x, 0) = \phi_0(x), \phi_t(x, 0) = \phi_1(x) \text{ in } x \in \Omega,$$

Where Ω be a bounded domain or \mathbb{R}^n , $n \leq 3$ with C^2 boundary Γ . We divide the boundary into two parts $\Gamma = \Gamma_0 \cup \Gamma_1$, $\overline{\Gamma_0} \cap \overline{\Gamma_1} = \emptyset$ and Γ_0, Γ_1 have positive measures. Let Q be the infinite cylinder $\Omega \times (0, \infty)$ whose lateral boundary is $\Sigma = \Gamma \times (0, \infty)$ and η denotes the unit outer normal vector pointing towards Ω , ν and γ are positive constants, f and g driving terms.

This system describes the interaction of a nucleon field ψ and a meson field ϕ through the Yukawa coupling.

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