Abstract

We prove Strichartz estimates (both regular and reversed) for a scattering state to the wave equation with a charge transfer Hamiltonian in $\mathbb{R}^3$:

$$\partial_{tt} u - \Delta u + \sum_{j=1}^{m} V_j \left(x - \vec{v}_j t\right) u = 0.$$

The energy estimate and the local energy decay of a scattering state are also established. In order to study nonlinear multisoltion systems, we will present the inhomogeneous generalizations of Strichartz estimates and local decay estimates. As an application of our results, we show that scattering states indeed scatter to solutions to the free wave equation. These estimates for this linear models are also of crucial importance for problems related to interactions of potentials and solitons, for example, in [**GC4**].