1086-65-828 **Thinh T Kieu*** (thinh.kieu@ttu.edu), 4306 16th Street, Quaker Pines Apt#5, Lubbock, TX 79416. *Galerkin Finite Element Method for Semilinear Hyperbolic Equations.*

We study the second order semi-linear hyperbolic equation on bounded domain in $\mathbb{R}^d, d = 2, 3$ with smooth boundary given by

$$u_{tt} - \nabla \cdot (\nabla u) + f(u) = g \text{ with } |f'(u)| \leq C(1 + |u|^p) \quad 0 \leq p \leq \frac{2}{d-2}.$$

We prove that the semidiscrete method conserves the energy. We also establish the improved L^2-error estimates for our method in both semidiscrete and fully discrete schemes, using the Sobolev-Poinceré inequality and the Gronwall inequality.

(Received September 13, 2012)