1069-35-270 **Chengbo Wang*** (wangcbo@jhu.edu), Department of Mathematics, Johns Hopkins University, 3400 N. Charles Street, Baltimore, MD 21218. *Long time existence for semilinear wave equations with low regularity.* Preliminary report.

In this talk, we will discuss two of our recent works on the long time existence for semi-linear wave equations for initial data with low regularity. The equations we will consider are as follows ($n \geq 2$, $p > 1$)

$$\begin{cases} \partial_t^2 u - \Delta u = a|\partial_t u|^p + b|\nabla_x u|^p \\ u(0,x) = u_0(x),\, \partial_t u(0,x) = u_1(x),\, x \in \mathbb{R}^n \end{cases}$$

For such problems with small data, there is a critical p (denoted by p_c) for the problem to have global existence. It was conjectured to be $p_c = 1 + \frac{2}{n-1}$ by R. Glassey (1983).

In the work with K. Hidano and K. Yokoyama, we are expected to verify this conjecture in the radial case, by proving the global existence for $p > p_c$, almost global existence for $p = p_c$, and long time existence for $1 < p < p_c$. Moreover, our lower bound on the lifespan will be essentially optimal.

In another work with D. Fang, we considered the cases $p \geq 3$ and $p \in \mathbb{N}$. For such indices, we were able to prove the similar results for the general data, by requiring some additional angular regularity. (Received January 24, 2011)