1090-35-167          **Zhuangyi Liu\*** (`zliu@d.umn.edu`). *Stability and Regularity of an Abstract System of Coupled Hyperbolic and Parabolic System.*

In this talk, for parameters $(\alpha, \beta) \in S = [0,1] \times [0,1]$, we consider an abstract system of coupled hyperbolic and parabolic equations

$$
\begin{cases}
u_{tt} = -Au + \gamma A^\alpha \theta, \\
\theta_t = -\gamma A^\alpha u_t - k A^\beta \theta, \\
u(0) = u_0, \quad u_t(0) = v_0, \quad \theta(0) = \theta_0
\end{cases}
\tag{1}
$$

where $A$ is a self-adjoint, positive definite operator on a Hilbert space $H$.

We will give a complete stability analysis and regularity analysis for (**??**). Indeed, the unit square $S$ can be divided into stability sub-regions where (**??**) is exponentially stable, polynomially stable, and unstable, respectively. On the other hand, the unit square $S$ can also be divided into regularity sub-regions where the semigroup (**??**) is analytic, of Gevrey class, and non-smooth, respectively.

(Received February 27, 2013)