

# **Applied Dynamical Systems Seminar**

**Dr. Shu Zhang, PDF, Memorial University**

**Monday, February 04, 2013**

**13:00-14:00**

**HH-3026**

## **Stability Switch Boundaries in an Internet Congestion Model with Diverse Time Delays**

### **Abstract:**

**For a two-dimensional congestion control model with diverse time delays, this paper provides a detailed study on the geometrical properties of stability switch boundaries in the plane of time delays.**

**Conditions for stability switch boundaries to arise as vertical spiral-like curves, horizontal spiral-like curves, diagonal spiral-like curves and closed-loops are obtained on the system parameters other than time delays. The boundary curves may self-intersect or intersect with one another. Some of these intersections are identified as tangent double Hopf bifurcation with codimension three. It is found that double Hopf bifurcation point exists in the plane of time delays regardless of the values of the other system parameters.**