1106-34-1298   **Krishna P Pokharel*** (`kpokhar@rockets.utoledo.edu`), 1247 Oak Hill Ct Apt#267, Toledo, OH 43614, and **A Arsie**. *An isospectral flow for Hessenberg matrices and its optimality.*

In this talk, we discuss an isospectral flow (Lax flow) in the space of matrices, which deforms any given complex upper Hessenberg matrix with simple spectrum to a normal upper Hessenberg matrix. Furthermore, we prove that if the spectrum of the initial condition is contained in a line l inside the complex plane, then its omega-limit set is actually a tridiagonal normal matrix possessing a special symmetry among the off diagonal elements. Moreover, we prove that this flow provides the solution of an infinite-time horizon optimal control problem.

Some simulations results are provided to highlight some aspects of this nonlinear system. As a farther application, we show that the flow can be used to construct even dimensional tridiagonal real skew-symmetric matrices with given simple imaginary spectrum and with given sign pattern for the codiagonal elements.

The main technical aspect of the work is to prove that the omega-limit set of suitable initial conditions consists of a single point in the phase space. (Received September 11, 2014)