1077-65-2444 **M. Badawy*** (mbadawy@math.ku.edu) and **Erik S. Van Vleck** (evanvleck@math.ku.edu).

Perturbation theory for the approximation of stability spectra by QR methods for products of linear operators on a Hilbert space.

In this talk, we go over the results that we obtained in a recent paper where we establish a quantitative perturbation theory for stability spectra (Lyapunov exponents and Sacker-Sell spectrum), based upon the so-called discrete QR technique, for sequences of linear operators on an infinite dimensional Hilbert space. In particular, we obtain component-wise bounds on the unitary and upper triangular factors under the assumption of either having the integral separation, or non-integral separation (but stable Lyapunov exponents) of the upper triangular operators. Integral separation is a natural analogue for products of matrices (in the finite dimensional case) to having gaps between eigenvalues of a matrix. We study the discrete mapping problem of non-autonomous infinite dimensional dynamical systems formulated as sequence of operators acting on a complex Hilbert space, making the results applicable to certain linear non-autonomous partial differential equations. We achieve the error bounds by formulating the existence of the unitary operators as a zero-finding problem, then apply the Newton-Kantorvich theorem, which not only gives us the sufficient conditions for the existence of a solution, but also yields bounds on the error in the unitary operators. (Received September 22, 2011)