APPLIED MATHEMATICS SEMINAR

Department of Mathematics

University of West Georgia

11:00 AM, WEDNESDAY, SEPTEMBER 5, 2007, BOYD 330

Speaker: Dr. Nguyen Van Minh, UWG

Title: **The "0-2" Law and Katznelson-Tzafriri type theorems in linear dynamical systems**

Abstract

In this talk I will talk about new developments in the study of the behavior of dynamical systems in connection with Katznelson-Tzafriri theorems. From the viewpoint of Operator Theory Y. Katznelson, L. Tzafriri, (in "*On power bounded operators. J. Funct. Anal.* 68 (1986), p. 313–328.") examined the 0-2 law in Probability Theory discovered by D. Orstein, L. Sucheston, in the paper "*An operator theorem on L_1 convergence to zero with applications to Markov kernels. Ann. Math. Statist.* 41 (1970). p 1631–1639." This law says that for any positive contraction T on an L_1-space, either $\|T^{n+1} - T^n\| = 2$, or $\lim_{n\to\infty} \|T^{n+1} - T^n\| = 0$. Many extensions and analogs of this theorem have been made to linear dynamical systems by Vu Quoc Phong, W. Arendt, C.J.K. Batty, J. van Neerven, Rabiger, J. Pruess, B. Basit, A. Pryde. And these results are called Katznelson-Tzafriri type theorems.

I will speak about an approach using the spectral theory of functions I developed recently to study the individual solutions of $u'(t) = Au(t)+f(t)$, where A is not necessarily the generator of a C_0-semigroup on a Banach space $\mathbb{X}$, f is a function taking values on $\mathbb{X}$ converging to zero.

The obtained results "seem to be an interesting addition to the well-established theory" as concluded by the referee of the paper where I wrote about this.

All are welcome.