

Meeting: 1005, Newark, Delaware, SS 4A, Special Session on Asymptotic Behavior of Evolution Equations

1005-37-193 **Ciprian Ion Preda*** (preda@math.ucla.edu), 6240 Mathematical Science Building, Department of Mathematics, 520 Portola Plaza, University of California, Los Angeles, CA 90095-1555. *A discrete approach of the property of exponential stability for strongly continuous semigroups.*

We will consider a strongly continuous semigroup acting on a Banach space X and we will characterize its exponential stability in terms of the existence of certain functionals defined on the set of all real positive sequences. This type of approach gives a "discrete" way to prove the exponential stability of a C_0 -semigroup and it is based on the very simple observation that a sequence belongs to l^p if and only if there exists a positive functional which is finite on the respective sequence. This type of ideas were also used successfully by Van Neerven in some continuous-time approaches about the exponential stability of semigroups, but using obviously other type of functionals. The present result extends also a well-known "discrete" theorem proved by Zabczyk in 1974. Also are given some applications of this approach to the representation of certain linear continuous-time systems by transfer functions. (Received February 08, 2005)