EXPONENTIAL STABILITY AND EXPONENTIAL DICHOTOMY OF SEMIGROUPS OF LINEAR OPERATORS

BOGDAN SASU

Abstract. The aim of this paper is to establish necessary and sufficient conditions for exponential stability of semigroups of linear operators and to show how this conditions can be applied in order to characterize the exponential dichotomy. First, we prove that an exponentially bounded semigroup is exponentially stable if and only if it is \(l^p(N, X), l^\infty(N, X)\)-stable, where \(p \in (1, \infty)\). After that this result is applied at the study of the exponential dichotomy of exponentially bounded semigroups. We deduce that an exponentially bounded semigroup is exponentially dichotomic if and only if the pair \(l^\infty(N, X), l^p(N, X)\) is admissible for it and an associated subspace is closed and complemented.

MSC 2000. 34D09, 34D05.

Key words. Semigroup of linear operators, exponential stability, exponential dichotomy.

REFERENCES


Received December 10, 2004

Department of Mathematics
Faculty of Mathematics and Computer Science
West University of Timișoara
Bul. V. Pârvan 4
300223 Timișoara, Romania
E-mail: sasu@math.uvt.ro, lbsasu@yahoo.com