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DISCRETE ADMISSIBILITY AND EXPONENTIAL DICHOTOMY FOR EVOLUTION FAMILIES

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Abstract. In this paper we study the uniform exponential dichotomy property for evolution families using discrete - time admissibility of some suitable pairs of spaces, so-called discrete Schäffer spaces, which are invariant at translations . The obtained result generalize some results published by Coffman, Schäffer, Ben - Artzi, Gohberg, Pinto.

Keywords. evolution families, exponential dichotomy.
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1 Introduction

The concept of exponential dichotomy of linear differential equations was introduced by O. Perron in 1930 [18], which is concerned with the problem of conditional stability of a system $x' = A(t)x + f(t,x)$ in a finite-dimensional space. After seminal researches of O. Perron, relevant results concerning the extension of Perron's problem in the more general framework of infinite-dimensional Banach spaces were obtained by M. G. Krein, J. L. Daleckij, R. Bellman, J. L. Massera and J. J. Schäffer. In the last three decades a great number of papers about dichotomies and qualitative behavior of evolutionary processes was published. We have different characterization of exponential dichotomy for a strongly continuous, exponentially bounded evolution family in the papers due to N. van Minh [15,16], Y. Latushkin[3,9,10,11], P. Randolph [10,11], P. Preda[14,20], M. Megan[13,14], R. Schnaubelt [11,23], S. Montgomery -Smith[9]. For the case of discrete-time systems analogous results were firstly obtained by Ta Li in 1934 [see 24]. In his paper, we remark the same central concern as in Perron's work, but in another terms. In fact it was proposed that the non-homogeneous equation is responsible in some sense for the asymptotic behaviour of the solutions for the homogeneous equation. In this spirit were established connections between the condition that the non-homogeneous equation has some bounded solution for every bounded "second member" on the one hand and a certain form of conditional stability of the solutions of the homogeneous equation on the other.