Dynamics of Continuous, Discrete and Impulsive Systems
Series **A:** *Mathematical Analysis* **16 (2009)** 397-412
 http://www.watam.org

ON EXPONENTIAL EXPANSIVENESS OF LINEAR SKEW-PRODUCT FLOWS

Adina Luminiţa Sasu

Department of Mathematics
Faculty of Mathematics and Computer Science
West University of Timişoara
Bul. V. Pârvan No. 4, 300223–Timişoara
Romania

E-mail addresses: sasu@math.uvt.ro, lbsasu@yahoo.com

Abstract. We associate with a linear skew-product flow a family of integral equations and define an admissibility concept, such that the spaces of the admissible pair belong to certain classes of function spaces, which are invariant under translations and satisfy some technical properties. We give new characterizations for exponential expansiveness of linear skew-product flows in terms of the admissibility, identifying the classes of input spaces and respectively the classes of output spaces that may be used in the admissible pair. Finally we present an example which motivates the methods and also shows that the hypotheses of the main result cannot be removed.

Keywords. exponential expansiveness, exact admissibility, linear skew-product flows, Banach function spaces, control system.

AMS (MOS) subject classification: 34D05, 34D09.

1 Introduction

The paper is devoted to the study of uniform exponential expansiveness of linear skew-product flows in infinite-dimensional spaces. This asymptotic property was studied for the first time in [8], where we established the connections between the uniform exponential expansiveness of a linear skew-product flow on $X \times \Theta$ and the uniform admissibility of the pair $(c_0(\mathbb{N}, X), c_0(\mathbb{N}, X))$. The discrete-time results in [8] were generalized in [20], where the author considered and solved the case of variational difference equations. He introduced a class of Banach sequence spaces and deduced the connections between the complete admissibility of the pair $(\mathcal{B}(\Theta, V(\mathbb{N}, X)), U(\mathbb{N}, X))$ with U, V in that class and the uniform exponential expansiveness of a system of variational difference equations. The obtained results were applied in order to give discrete-times characterizations for exponential expansiveness of linear skew-product flows.