

SEMINÁRIO DE ANÁLISE

Difference Equations of type Volterra: A Qualitative Study

Mario Choquehuanca
Universidade de La Frontera

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Abstract

Let \mathbf{X} be an arbitrary Banach space. We will study qualitative properties of the Volterra difference equation given by

$$u(n+1) = \lambda \sum_{j=-\infty}^n a(n-j)u(j) + g(n, u), \quad n \in \mathbb{Z}, \quad (1)$$

where λ is a complex number, $a : \mathbb{N} \rightarrow \mathbb{C}$, and g are appropriate functions.

For this purpose we present a result of l^p -boundedness of the solution for linear Volterra difference equations, show a solution existence result l^p -boundedness of the Volterra functional difference equation given by

$$u(n+1) = \lambda \sum_{j=-\infty}^n a(n-j)u(j) + f(n, u_n), \quad n \in \mathbb{Z}, \quad (2)$$

where $f : \mathbb{Z} \times \mathcal{B} \rightarrow \mathbf{X}$ is an appropriate function and $u_n : \mathbb{Z}_- \rightarrow \mathbf{X}$ is the pre-history function

We conclude by mentioning some qualitative properties of the set of solutions of the equation (??) as: Asymptotic behavior, continuity and compactness, also the adaptation of this theory to the Turelli-Hoffman-Schofield model for propagation of *Wolbachia* bacteria.

Referências

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