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$\mu-$PSEUDO ALMOST PERIODIC SOLUTIONS IN THE $\alpha-$NORM TO SOME NEUTRAL PARTIAL DIFFERENTIAL EQUATIONS WITH FINITE DELAY

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Abstract. In this work, we discuss the existence and uniqueness of μ-pseudo almost periodic solutions in the $\alpha-$norm for some neutral partial differential equations with finite delay.

Keywords. Analytic semi-group; Neutral partial differential equation; $\mu-$pseudo almost periodic solution; Finite delay.

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1 Introduction

The existence and uniqueness of almost periodic and pseudo almost periodic solutions has been one of the most attractive topics in the qualitative theory of ordinary or functional differential equations for its significance in the physical sciences, mathematical biology, and control theory. The aim here is to study the existence and uniqueness of $\mu-$pseudo almost periodic solutions for the following partial neutral differential equation with finite delay:

$$\begin{cases} \dfrac{d}{dt}\big[x(t) - G(t, x_t)\big] = -A\big[x(t) - G(t, x_t)\big] + F(t, x_t) \quad \text{for } t \geq 0, \\ x_0 = \varphi \in C_\alpha, \end{cases} \tag{1}$$

where $-A$ is the infinitesimal generator of an uniformly exponentially stable analytic semigroup $(T(t))_{t\geq 0}$ on a Banach space X, $C_\alpha := C([-p, 0], D(A^\alpha))$, $p > 0$, and $0 < \alpha < 1$, denotes the space of continuous functions from