LARGE TIME BEHAVIOUR OF NEUTRAL DELAY SYSTEMS

MIGUEL VINÍCIUS SANTINI FRASSON

We are interested in *functional differential equations* (FDE) of the form

$$\begin{aligned} \tfrac{d}{dt} M x_t &= L x_t, \\ x_0 &= \varphi \in \mathcal{C}. \end{aligned} \tag{1}$$

where M and L are linear continuous operators from the space state $\mathcal{C} \stackrel{\text{def}}{=} \mathcal{C}([-1,0],\mathbb{C}^n)$ to $\mathbb{C}^n$, and $x_t \in \mathcal{C}$ is defined as

$$x_t(\theta) = x(t+\theta), \qquad \theta \in [0,1], \quad t \geqslant 0.$$

We aim to show a decomposition of the space state $\mathcal{C} \stackrel{\text{def}}{=} \mathcal{C}([-1,0],\mathbb{C}^n)$ as direct sums of $\mathcal{M}_\lambda \oplus \mathcal{Q}_\lambda$, where $\mathcal{M}_\lambda$ is a finite dimensional subspace of $\mathbb{C}$, and estimates that reduce the large time behaviour of solutions of the initial value problem (**??**) to an ordinary differential equation in $\mathbb{C}^n$.

References

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(Miguel V. S. Frasson) Departamento de Matemática Aplicada e Estaística, Instituto de Ciências Matemáticas e de Computação, Universidade de São Paulo-Campus de São Carlos, Caixa Postal 668, 13560-970 São Carlos SP, Brazil

E-mail address: `frasson@icmc.usp.br`