

# Chaotic behavior of the solution $C_0$ -semigroup of the von Foerster-Lasota equation in different phase spaces

JAVIER AROZA<sup>1</sup>, ELISABETTA MANGINO<sup>2</sup>

<sup>1</sup> *Institut Universitari de Matemàtica Pura i Aplicada, Universitat Politècnica de València, E-46022 València, Spain.*

*E-mail: jaarben@upvnet.upv.es*

<sup>2</sup> *Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento, I-73100 Lecce, Italy.*

*E-mail: elisabetta.mangino@unisalento.it*

The usually so-called von Foerster-Lasota equation, or McKendrick equation, is one of the first age-dependent models in dynamics of population. We will see that the solution  $C_0$ -semigroup of this equation is chaotic on  $L^p[0, 1]$  and in the subspace of the Sobolev spaces  $W^{1,p}(0, 1)$  of functions vanishing at the origin, where  $p \in [1, +\infty)$ . The approach is different from that previously used by [2], since it is based on an accurate estimate of the behavior of the eigenvectors of the generator of the semigroup. The previous results have been generalized to the study of first order linear parabolic equation with a more general drift (for more details we refer the reader to [1]).

## References

- [1] Aroza, Javier; Mangino, Elisabetta, *Generalized equation of von Foerster-Lasota and Devaney chaos*, Preprint.
- [2] Brzeźniak, Zdzisław; Dawidowicz, Antoni Leon, *On periodic solutions to the von Foerster-Lasota equation*, Semigroup Forum **78.1** (2009), 118–137.