

# Global Stability of Higher Dimensional Monotone Models: Applications to Leslie-Gower and Ricker competition models

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In a previous work [2, 3], the authors established global stability for a certain class of models. Based in these results, we introduce and develop in a forthcoming paper [1], a new notion of normal monotonicity of higher dimensional models defined on Euclidean spaces  $\mathbb{R}^k$ . Under certain conditions, we determine the global dynamics of normally monotone maps and show that if the dynamical system has a unique interior fixed point, then it must be globally asymptotically stable.

In this talk we will show the effectiveness of our results providing detailed proofs of the global stability of two important competition models: the Leslie-Gower model and the Ricker competition model.

[1] Balreira, E.C., Elaydi, S., and Luis, R., Geometry and Global Stability of Higher Dimensional Monotone Maps, *Preprint*.

[2] Balreira, E. C., Elaydi, S., and Luis, R., Local stability implies global stability for the planar Ricker competition model *Discrete and Continuous Dynamical Systems - Series B*, 19(2) (2014), 323–351.

[3] Balreira, E. C., Elaydi, S., and Luis, R., Global dynamics of triangular maps, *Nonlinear Anal.*, 104 (2014), 75–83.

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<sup>1</sup>Joint work with E. Cabral Balreira and Saber Elaydi