

Mathematical Modelling in Life Sciences and Technology

Seasonally dependent competitive Kolmogorov systems: extinction or coexistence?

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We will consider a periodic Kolmogorov system describing the interaction of two competing species experiencing a seasonally fluctuating environment. Under assumptions that generalise Gopalsamy conditions, we will discuss coexistence or extinction of one or both species, and describe the domain of attraction of the nontrivial periodic solutions in the axes.

Our results may be applied to models with nonlinear competition, which have been studied in the biological literature, such as models of microbial growth or of phytoplankton competition under the effect of toxins.

Time permitting, we will also consider a two species amensalism model, a biological interaction in which one species may harm the other, but the reverse is not true.

References

- [1] COELHO, ISABEL, REBELO, CARLOTA, SOVRANO, ELISA, *Extinction or coexistence in periodic Kolmogorov systems of competitive type*, Discrete Contin. Dyn. Syst., 41, 5743 - 5764 (2021).