Dynamics of a logistic equation with unbounded time depend coefficients

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Abstract
The aim of this talk is the study of the following non-autonomous logistic ODE
\[
\begin{aligned}
&x'(t) = \rho(t)x(t) - \eta(t)x^2(t), \\ &x(s) = x_s, \quad x_s \in \mathbb{R},
\end{aligned}
\]
t \in \mathbb{R}
where both functions \( \rho, \eta : \mathbb{R} \to \mathbb{R} \) are not necessary bounded, \( \eta(t) > 0 \) and \( \rho(t) \) can be negative in a bounded subset. The main idea in this case is to use the well known techniques in the autonomous case to obtain a function that gives us information about the dynamic of the system in a very simple way. Then we will apply that to a non-autonomous prey-predator system to obtain the permanence of solutions.

References


