Kuang, Yang

Global stability in delay differential systems without dominating instantaneous negative feedbacks. (English) Zbl 0828.34066

J. Differ. Equations 119, No. 2, 503-532 (1995).

The systems $x_i'(t) = x_i(t)f_i(t, x_t(\cdot))$, $i = 1, \ldots, n$ and $x_i'(t) = x_i(t)f_i(t, x_t(\cdot), y_t(\cdot))$, $i = 1, \ldots, n$, $y_j'(t) = g_j(t, x_t(\cdot), y_t(\cdot))$, $j = 1, \ldots, m$ are considered with f_i and g_j continuous linear operators.

It is shown that if the systems have globally asymptotically stable nonnegative equilibria in the absence of the delays and if the systems are dissipative if delays are present (solutions are eventually uniformly bounded), then the equilibria remain globally asymptotically stable as long as the time lags involved in some part of the negative feedbacks are small enough.

Reviewer: A.Halanay (Bucureşti)

MSC:

34K20 Stability theory of functional-differential equations
92D25 Population dynamics (general)

Keywords:

delayed Lotka-Volterra systems; global stability; negative feedbacks

Full Text: DOI