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一类非线性中立型系统的渐近稳定性

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Asymptotic Stability on a Class of Nonlinear Neutral Systems

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摘要 讨论了一类非线性中立型系统的渐近稳定性问题. 引入了适当的向量Lyapunov-Krasovskii泛函, 给出了不仅依赖于滞后项时滞, 而且还依赖于中立项时滞的稳定性判据. 改进了先前用于算子D中所施加的限制 $0 < |\alpha| < 1$. 判定条件由LMI给出, 可以通过Matlab中的工具箱比较容易地进行求解. 最后给出了数值仿真, 以说明判据的可行性.

关键词: 渐近稳定性 中立型系统 时滞相关 线性矩阵不等式

Abstract: This work gives a criterion for asymptotic stability of a class of nonlinear neutral differential systems. By introducing suitable vector Lyapunov-Krasovskii functional, a delay dependent criterion which not only depends on the discrete delay but also on the neutral delay is presented. This paper has also broken away from the assumption of $0 < |\alpha| < 1$, which is used in the operator D in earlier report. The sufficient condition is expressed in terms of linear matrix inequality. In the end of the work, utilizing Matlab toolbox, the numerical simulation examples are presented to illustrate feasibility of the criterion.

Key words: asymptotic stability neutral systems delay dependent criteria LMI approach

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