

应用数学学报 » 2013, Vol. 36 » Issue (6): 1080-1093 DOI:

论文

最新目录 | 下期目录 | 过刊浏览 | 高级检索

◀◀ Previous Articles | Next Articles

含有连续分布时滞偶阶微分方程的振动性

田亚州¹, 蔡远利¹, 孟凡伟²1. 西安交通大学电子与信息工程学院, 西安 710049;
2. 曲阜师范大学数学科学学院, 曲阜 273165

Oscillation Criteria for Even Order Differential Equations with Continuous Distributed Delay

TIAN Yazhou¹, CAI Yuanli¹, MENG Fanwei²1. School of Electronic and Information Engineering, Xi'an Jiaotong University, Xi'an 710049;
2. Department of Mathematics, Qufu Normal University, Qufu 273165

- 摘要
- 参考文献
- 相关文章

全文: [PDF \(297 KB\)](#) [HTML \(1 KB\)](#) 输出: [BibTeX](#) | [EndNote \(RIS\)](#) [背景资料](#)

摘要 本文研究了一类含有连续分布时滞偶数阶中立型微分方程的振动性, 利用推广的Riccati变换和平均值技巧得到了该方程所有解均为振动的若干新的振动准则, 推广和改进了已有文献中的主要结果, 最后给出了几个例子说明结果优越性.

关键词: 振动性 中立微分方程 偶数阶

Abstract: In this paper a class of even order neutral differential equations with continuous distributed delay are studied. By using the generalized Riccati technique and the averaging technique, we establish several new oscillation criteria for all solutions of the equations, which generalize and improve some known results. Examples are given to illustrate the superiority of our main results.

Key words: oscillation neutral differential equations even order

收稿日期: 2011-08-20;

基金资助: 国家自然科学基金(11171178), 国家高等学校博士点科研基金(20103705110003)资助项目.

服务

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ E-mail Alert
- ▶ RSS

作者相关文章

- ▶ 田亚州
- ▶ 蔡远利
- ▶ 孟凡伟

引用本文:

田亚州,蔡远利,孟凡伟. 含有连续分布时滞偶阶微分方程的振动性[J]. 应用数学学报, 2013, 36(6): 1080-1093.

TIAN Yazhou,CAI Yuanli,MENG Fanwei. Oscillation Criteria for Even Order Differential Equations with Continuous Distributed Delay[J]. Acta Mathematicae Applicatae Sinica, 2013, 36(6): 1080-1093.

- [1] Li H J, Yeh C C. An Integral Criterion for Oscillation of Nonlinear Differential Equations. *Math. Japonica.*, 1995, 41: 185-188
- [2] Agarwal R P, O'Regan D. Singular Boundary Value Problems for Superlinear Second Order Ordinary and Delay Differential Equations. *Journal of Differential Equations*, 1996, 130: 333-355 
- [3] Sun Y G, Meng F W. Note On the Paper of Dzurina and Stavroulakis. *Appl. Math. Comput.*, 2006, 174: 1634-1641 
- [4] Liu Y S, Yu H M. Existence and Uniqueness of Positive Solution for Singular Boundary Value Problems. *Comput. Math. Appl.*, 2005, 47: 133-143 
- [5] Wang P G. Oscillation Criteria for Second Order Neutral Equations with Distributed Deviating Arguments. *Comput. Math. Appl.*, 2006, 47: 1935-1946 
- [6] 赵增勤. 非线性奇异微分方程边值问题的正解. *数学学报*, 2000, 43 (1): 179-188(Zhao Z Q. Positive Solutions of Boundary Value Problems for Nonlinear Singular Differential Equations. *Acta Mathematica Sinica*, 2000, 43 (1): 179-188)

- [7] Wang P G, Teo K L, Liu Y Q. Oscillation Properties for Even Order Neutral Differential Equations with Distributed Deviating Arguments. *Comput. Appl. Math.*, 2005, 182: 290-303 
- [8] Agarwal R P, O'Regan D. Multiplicity Results for Singular Conjugate, Focal, and (n, p) Problems. *J. Differential Equations*, 2001, 174: 142-156 
- [9] Agarwal R P, O'Regan D. Existence Criteria for Singular Boundary Value Problems with Sign Changing Nonlinearities. *Journal of Differential Equations*, 2002, 183: 409-433 
- [10] Meng F W, Xu R. Oscillation Criteria for Certain Even Order Quasi-linear Neutral Differential Equations with Deviating Arguments. *A Math. Comput.*, 2007, 190: 458-464 
- [11] Yu Y H, Fu X L. Oscillation of Second Order Nonlinear Differential Equations with Continuous Distributed Deviating Arguments. *Rac Mat.*, 1991, 7: 167-176
- [12] Zhang X G, Liu L S. Positive Solutions of Superlinear Semipositone Singular Dirichlet Boundary Value Problems. *J. Math. Anal. Appl.*, 2006, 316: 525-537 
- [13] Liu Y S. Twin Solutions to Singular Semipositone Problems. *J. Math. Anal. Appl.*, 2003, 286: 248-260 
- [14] Philos Ch G. A New Criteria for the Oscillatory and Asymptotic Behavior of Delay Differential Equations. *Bull. Acad. Pol. Sci. Ser. Sci. Mat.*, 1981, 39: 61-64
- [15] Philos Ch G. Oscillation Theorems for Linear Differential Equation of Second Order. *Arch. Math.*, 1989, 53: 482-492 
- [16] 李兴昌; 田仕芹. 二阶非共振半正边值问题正解的存在性. *系统科学与数学*, 2010, 30: 1401-1416(Li X C, Tian S Q. Existence of Positive Solutions of Nonresonant Singular Second Order Boundary Value Problem. *J. Sys. Sci. & Math. Sci.*, 2010, 30: 1401-1416)
- [17] Yao Q L. Existence of Positive Solutions to a Semi-positone Sturm-Liouville Boundary Value Problem. *Advances in Mathematics*, 2010, 33: 719-725
- [18] Hardy G H, Littlewood J E, Polya G. Inequalities, Second ed. Cambridge: Cambridge Univ. Press, 1988
- [19] Yao Q L. An Existence Theorem of a Positive Solution to a Semipositone Sturm-Liouville Boundary Value Problem. *Appl. Math. Lett.*, 2010, 23: 1401-1406 
- [20] Agarwal R P, Grace S R, O'Regan D. Oscillation Criteria for Certain nth Order Differential Equations with Deviating Arguments. *J. Math. Annal. Appl.*, 2001, 262: 601-622 
- [21] Li H Y, Sun J X. Positive Solutions of Sublinear Sturm-Liouville Problems with Changing Sign Nonlinearity. *Comput. Math. Appl.*, 2009, 58: 1808-1815 
- [22] Xu Z T, Xia Y. Integral Averaging Technique and Oscillation of Certain Even Order Delay Differential Equations. *J. Math. Annal. Appl.*, 2004, 292: 238-246 
- [1] 郭松柏, 沈有建. 一阶中立型差分方程振动的充分必要条件[J]. 应用数学学报, 2013, 36(5): 840-850.
- [2] 孙一冰, 韩振来, 孙书荣, 张超. 时间尺度上一类二阶具阻尼项的半线性中立型时滞动力方程的振动性[J]. 应用数学学报, 2013, 36(3): 480-494.
- [3] 钟记超, 欧阳自根, 邹树梁. 一类带有阻尼项的二阶半线性中立型微分方程解的振动准则[J]. 应用数学学报, 2012, 35(6): 972-983.
- [4] 王冬梅, 徐志庭. 二阶拟线性中立型差分方程的振动性[J]. 应用数学学报, 2011, 34(3): 537-553.
- [5] 王桂霞, 孙炯. 带转移条件的Strum-Liouville问题特征函数的振动性[J]. 应用数学学报, 2010, 33(3): 395-411.
- [6] 郭志明, 庾建设, 雷光龙. 具有时滞的利率-流通量方程的建立及其应用[J]. 应用数学学报, 2004, 27(4): 702-709.
- [7] 常玉. 一类四阶差分方程振动性的充分必要条件[J]. 应用数学学报, 2000, 23(3): 466-471.