

Equations Of Mixed Type

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Mathematical Publications
DOI: 10.2478/v10127-011-0010-8
Tatra Mt. Math. Publ. 48 (2011), 101–116

OSCILLATION RESULTS FOR SECOND-ORDER NEUTRAL DIFFERENTIAL EQUATIONS OF MIXED TYPE

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ABSTRACT. Some oscillation theorems are established for the second-order linear neutral differential equations of mixed type
 $(r(t)[x(t) + p_1(t)x(t - \sigma_1) + p_2(t)x(t + \sigma_2)]' + q_1(t)x(t - \sigma_3) + q_2(t)x(t + \sigma_4) = 0$.
Several examples are also provided to illustrate the main results.

1. Introduction

This paper is concerned with the oscillatory behavior of the second-order linear neutral differential equation of mixed type

$$(r(t)[x(t) + p_1(t)x(t - \sigma_1) + p_2(t)x(t + \sigma_2)]' + q_1(t)x(t - \sigma_3) + q_2(t)x(t + \sigma_4) = 0, \quad t \geq t_0. \quad (1.1)$$

Throughout this paper, we will assume the following conditions hold:

- (A₁) $r \in C^1([t_0, \infty), \mathbb{R})$, $r(t) > 0$ for $t \geq t_0$;
- (A₂) $p_i \in C([t_0, \infty), [0, a_i])$, where a_i are constants for $i = 1, 2$;
- (A₃) $q_j \in C([t_0, \infty), [0, \infty))$, for $j = 1, 2$;
- (A₄) $\sigma_i \geq 0$ are constants, for $i = 1, 2, 3, 4$.

By a solution of Eq. (1.1), we mean a function $x \in C([T_x, \infty), \mathbb{R})$ for some $T_x \geq t_0$ which has the properties $[x(t) + p_1(t)x(t - \sigma_1) + p_2(t)x(t + \sigma_2)] \in C^1([T_x, \infty), \mathbb{R})$ and $r(t)[x(t) + p_1(t)x(t - \sigma_1) + p_2(t)x(t + \sigma_2)] \in C^1([T_x, \infty), \mathbb{R})$ and satisfying Eq. (1.1) on $[T_x, \infty)$. As is customary, a solution of Eq. (1.1) is

© 2011 Mathematical Institute, Slovak Academy of Sciences.
2010 Mathematics Subject Classification: 34K40, 34K11.
Key words: oscillation; neutral differential equations of mixed type; second-order.
This work was supported by the Slovak Research and Development Agency under the contract No. APVV-0073-07.

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Protter, Murray H. Review: M. M. Smirnov, Equations of mixed type. Bull. Amer. Math. Soc. (N.S.) 1 (), no. 3, optimumgc.com .EQUATIONS OF THE MIXED TYPE. By A. V. BITSADZE: pp. xiii, ; 60s. (Pergamon Press: Oxford). Since the fundamental work of Tricomi about forty years.Functional differential equations of mixed type (MFDE) are introduced; in these equations of functional type, the time derivative may depend.In recent years, developed an interest in the study of boundary value problems for equations of mixed type in rectangular areas. This method proved theorems.On Nonlinear Partial Differential Equations of Mixed Type. Gui-Qiang G. Chen. Oxford Centre for Nonlinear PDE. Mathematical Institute, University of Oxford.and with coefficients defined in the domain is an equation of mixed type if the discriminant of the characteristic form.Translations of Mathematical Monographs ; pp; Softcover MSC: Primary 35; Print ISBN: Product Code: MMONO/.optimumgc.com: Equations of Mixed Type (Translations of Mathematical Monographs) (): M. M. Smirnov: Books.Kapustin On Morawetz's method for proving the uniqueness theorems for solutions of some bondary-value problems for mixed-type equations Applied.Download Citation on ResearchGate On approximate solution for integral equations of mixed type The present paper is concerned with approximate solutions.PDF This paper includes various parts of the theory of mixed type partial differential equations with initial and boundary conditions in fluid mechanics, such as.for Second Order Equations of Mixed Type with Nonsmooth Degenerate Line the authors discussed the Tricomi problem of second order mixed equations.Some oscillation criteria are presented for the second-order nonlinear neutral differential equations of mixed type. where a, b and gamma are the ratio of odd.In this paper we discuss the existence of solutions for an integral equation of mixed type. We rely on a generalization on Fr ?echet spaces of a Krasnosel'skii type.Equations of the Mixed Type compiles a series of lectures on certain fundamental questions in the theory of equations of mixed type. This book.Invariant manifolds and applications for functional differential equations of mixed type. Promotor: S.M. Verduyn Lunel. Author: Hermen Jan.[9] HE, Z. M. HE, X. M.: Periodic boundary value problems for first order impulsive integro differential equations of mixed type, J. Math. Anal.

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