

## INTERVAL OSCILLATION CRITERIA FOR SECOND-ORDER QUASI-LINEAR FUNCTIONAL DIFFERENTIAL EQUATIONS

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**Abstract.** In this paper, new oscillation criteria for the second-order quasi-linear functional differential equations with damping of the form

$$(r(t)\psi(x(t))|x'(t)|^{\alpha-1}x'(t))' + p(t)|x'(t)|^{\alpha-1}x'(t) \\ + F(t, x(t), x(\tau(t)), x'(t), x'(\tau(t))) = e(t), \quad t \geq t_0,$$

are established. Our results are based on the information only on a sequence of subintervals of  $[t_0, \infty)$ , rather than on the whole half-line.

**Keywords.** Oscillation, forced term, damped term, quasi-linear differential equation, interval criteria.

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## 1 Introduction

This paper is concerned with the problem of oscillation of the forced second-order quasi-linear functional differential equations with damping of the form

$$(r(t)\psi(x(t))|x'(t)|^{\alpha-1}x'(t))' + p(t)|x'(t)|^{\alpha-1}x'(t) \\ + F(t, x(t), x(\tau(t)), x'(t), x'(\tau(t))) = e(t), \quad (1.1)$$

on the half-line  $[t_0, \infty)$ ,  $t_0 \geq 0$ . In what follows we assume with respect to (1.1) that

- (i)  $\alpha > 0$  is a constant;
- (ii)  $F : [t_0, \infty) \times R \times R \times R \times R \rightarrow R$  is a continuous function;
- (iii)  $r : [t_0, \infty) \rightarrow (0, \infty)$  is a continuous function;
- (iv)  $p : [t_0, \infty) \rightarrow R$  is a continuous function;
- (v)  $\psi : R \rightarrow R$  is a continuous function;
- (vi)  $e : [t_0, \infty) \rightarrow R$  is a continuous function;