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SUFFICIENT CONDITIONS FOR OSCILLATION OF LINEAR SECOND ORDER MATRIX DIFFERENTIAL SYSTEMS

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ABSTRACT. Sufficient conditions in terms of *trace* are obtained for the oscillation of all nontrivial prepared solutions of second order self-adjoint differential matrix systems

$$\big(P(t)Y'\big)' + Q(t)Y = 0, \quad t \geq \sigma \geq 0,$$

where P and Q are $n \times n$ real continuous symmetric matrix functions on $[\sigma, \infty)$ with $P(t)$ positive definite. Our results generalize earlier results on oscillation of scalar second order equation

$$\big(p(t)y'\big)' + q(t)y = 0, \quad t \geq \sigma \geq 0,$$

where $p, q \in C([\sigma, \infty), (-\infty, \infty))$ with $p(t) > 0$, and are applicable to Euler's second order matrix equations.

1. Introduction. Many oscillation criteria for self-adjoint second order linear differential equation

$$\big(p(t)y'\big)' + q(t)y = 0 \tag{1}$$

are known, where $p \in C([\sigma, \infty), (0, \infty))$, $q \in C([\sigma, \infty), (-\infty, \infty))$ and $\sigma \geq 0$. If $p(t) \equiv 1$, then (1) takes the form

$$y'' + q(t)y = 0. \tag{2}$$

A solution of (1) is said to be oscillatory if it has arbitrarily large zeros; otherwise, it is called nonoscillatory. Equation (1) is oscillatory if all its solutions are oscillatory. We use the following condition often:

(C_1) Let $D = \{(t, s) : t \geq s \geq \sigma\}$ and $D_0 = \{(t, s) : t > s \geq \sigma\}$. Let $h \in C(D, [0, \infty))$ satisfy the following conditions:

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