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COMPARISON THEOREMS FOR FOCAL POINTS OF SYSTEMS OF N-TH ORDER NONSELFADJOINT DIFFERENTIAL EQUATIONS

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ABSTRACT. A comparison theorem will be given for focal points of $x^{(n)} - \sum_{\mu=0}^{n-1} P_\mu(t)x^{(\mu)} = 0$, where $n \geq 2, P_\mu$ are $m \times m$ matrices with continuous elements on$[a.b], a \geq 0$, and where no assumptions are made concerning the symmetry of any of the P_μ nor the sign of the elements of P_μ.

A comparison theorem will be given for focal points of a very general class of linear ordinary differential equations, with continuous coefficient matrices. The system is

$$x^{(n)} - \sum_{\mu=0}^{n-1} P_\mu(t)x^{(\mu)} = 0 \tag{1}$$

where $n \geq 2, P_\mu$ are $m \times m$ matrices with continuous elements on $[a, b], a \geq 0$.

No assumptions are made concerning the symmetry of any of the P_μ so that (1) may be nonselfadjoint. If (1) is selfadjoint, the results presented here are new. No assumptions are made concerning the sign of the elements of P_μ, making the results new in the scalar case.

The focal point of (1) will be compared to that of

$$y^{(n)} - (-1)^{n-k} \sum_{\mu=0}^{n-1} Q_\mu(t)y^{(\mu)} = 0, \tag{2}$$

where $k \in \{1, \ldots, n-1\}$ and Q_μ are continuous $m \times m$ matrices on $[a, b]$ satisfying some positivity conditions with respect to a cone.

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