Frentzen, Hilbert

Limit-point criteria for symmetric and j-symmetric quasi-differential expressions of even order with a positive definite leading coefficient. (English) Zbl 0614.34011

Fachbereich Mathematik der Universität GHS Essen. 66 p. (1985).

The author presents some limit-point criteria for certain differential expressions with matrix-valued coefficients. The main result gives sufficient conditions for real polynomials in L, where L is a symmetric differential expression of the form $Ly = W^{-1}\sum_{i,j=0}^{m}(-1)^i(Q_{ij}y^{(j)})^{(i)}$, to be limit point up to a fixed degree. On the assumptions of Theorem 3.10, all real polynomials in L are limit-point.

Further theorems are related to differential expressions of the form

$$Ly = W^{-1}\{\sum_{j=0}^{m}(-1)^j(Q_{2j}y^{(j)})^{(j)} + \sum_{j=0}^{m-1}(-1)^j[(Q_{2j+1}^{\times}y^{(j+1)})^{(j)} - (Q_{2j+1}y^{(j)})^{(j+1)}]\},$$

where $Q^{\times}$ denotes the complex conjugate transposed matrix or the transposed matrix of the matrix Q. The results are general and include many of the theorems in the literature.

Reviewer: J.Kalas

MSC:

34A30 Linear ordinary differential equations and systems
34C05 Topological structure of integral curves, singular points, limit cycles of ordinary differential equations

Keywords:

J-symmetric quasi-differential expressions; limit-point criteria; symmetric differential expression; limit point