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ELA

SEPARABLE CHARACTERISTIC POLYNOMIALS OF PENCILS AND PROPERTY L*

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Abstract. The condition (SC): $\det(I-sA-tB)=\det(I-sA)\det(I-tB)$ for all scalars s,t, has naturally and long been connected to eigenvalue properties of the matrix pair A,B. In particular, Taussky used the notion of property L to generalize the Craig-Sakamoto Theorem by showing that when A and B are normal, (SC) is equivalent to $AB=0$. The relation of (SC) to the eigenspaces of A, B and $sA+tB$ is examined in order to obtain necessary and/or sufficient conditions in terms of eigenspaces and space decompositions. A general criterion for (SC) based on the spectrum of the $n\times n$ matrix polynomial $\lambda^{2n+1}I-\lambda^{2n}A-B$ is also presented.

Key words. Characteristic polynomial, Property L, Craig-Sakamoto Theorem, Matrix polynomial.

AMS subject classifications. 15A15, 15A18, 15A22

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