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# Hermitian matrices with invariant principal submatrix characteristic poynomials


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**Abstract**

This paper addresses a problem on Hermitian matrices arising from the theory of 2-structures.
Let n be a positive integer and k ∈{3, ..., n −3}. We study Hermitian matrices whose $k \times k$ principal submatrices have identical characteristic polynomials. Such matrices are called k -spectrally monomorphic.
We prove that k-spectral monomorphy implies l-spectral monomorphy for every l ∈{1, ..., min{k,n-k}}. This structural property allows us to characterize these matrices and highlights strong connections with conference matrices and spectral invariants.
Our results provide a deeper understanding of spectral monomorphy in the Hermitian framework and its combinatorial implications.




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