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On the unitary similarity of matrix families

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Abstract

The classical Specht criterion for the unitary similarity between two complex $n \times n$ matrices is extended to the unitary similarity between two normal matrix sets of cardinality m . This property means that the algebra generated by a set is closed with respect to the conjugate transpose operation. Similar to the well-known result of Percy that supplements Specht's theorem, the proposed extension can be made a finite criterion. The complexity of this criterion depends on n as well as the length l of the algebras under analysis. For a pair of matrices, this complexity can be significantly lower than that of the Specht-Pearcy criterion.

Keywords

Representation theory, Specht-Pearcy criterion, Unitary invariants, Unitary matrix, Unitary similarity