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A criterion for unitary congruence between matrices

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Abstract

A criteria for unitary congruence between matrices is discussed. Matrices are proved to be unitarily congruent and thus the verification of unitary congruence between two matrices reduces to the condition of unitary similarity between two matrix sets. A normal matrix family is proved to be unitarily similar to a normal matrix family and the functional is well defined if its values on the words are the same. To verify whether two families are unitarily similar, an upper bound for the length that depends only on n is required. A normal matrix family is also proved to be unitarily similar to a normal matrix family. A closed family with respect to matrix conjugation is also unitarily similar and thus a finite criterion for unitary congruence between two complex matrices is found.

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