POSITIVE COMMUTATORS AND COLLECTIONS OF OPERATORS

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Abstract. Let $A$ and $B$ be completely decomposable nonnegative matrices such that the commutator $AB - BA$ is also a nonnegative matrix. We prove that the set $\{A, B\}$ is completely decomposable, i.e., there exists a permutation matrix $P$ such that $PAP^{-1}$ and $PBP^{-1}$ are upper triangular matrices. We show similar results for collections of completely decomposable nonnegative matrices. We also find conditions on commutators under which a given operator on a Riesz space is necessarily scalar.


Keywords and phrases: Nonnegative matrices, semigroups of matrices, indecomposability, commutators.

REFERENCES