

# Commutativity of projections and characterization of traces on Von Neumann algebras

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## Abstract

We find new necessary and sufficient conditions for the commutativity of projections in terms of operator inequalities. We apply these inequalities to characterize a trace on von Neumann algebras in the class of all positive normal functionals. We obtain some characterization of a trace on von Neumann algebras in terms of the commutativity of products of projections under a weight. © 2010 Pleiades Publishing, Ltd.

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## Keywords

bounded linear operator, commutativity of operators, Hilbert space, normal functional, operator inequality, projection, spectral theorem, trace, von Neumann algebra, weight