

Trace and integrable operators affiliated with a semifinite von Neumann algebra

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Abstract

© 2016, Pleiades Publishing, Ltd. New properties of the space of integrable (with respect to the faithful normal semifinite trace) operators affiliated with a semifinite von Neumann algebra are found. A trace inequality for a pair of projections in the von Neumann algebra is obtained, which characterizes trace in the class of all positive normal functionals on this algebra. A new property of a measurable idempotent are determined. A useful factorization of such an operator is obtained; it is used to prove the nonnegativity of the trace of an integrable idempotent. It is shown that if the difference of two measurable idempotents is a positive operator, then this difference is a projection. It is proved that a semihyponormal measurable idempotent is a projection. It is also shown that a hyponormal measurable tripotent is the difference of two orthogonal projections.

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