

# Completeness of Gelfand-Neumark-Segal inner product space on Jordan algebras

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## Abstract

© 2016 Mathematical Institute Slovak Academy of Sciences. The paper deals with inner product spaces generated by states on Jordan algebras. We show an interplay between completeness of the Gelfand-Neumark-Segal representation space, geometric properties of states on Jordan algebras, structure of irreducible Jordan representations, and properties of normal states on second duals of Jordan algebras. We prove that if the GNS representation space is complete, then given state must be a convex combination of pure states. On the other hand, we analyze structure of inner product spaces arising from states on spin factors and Type In,  $n \geq 4$ , factors, showing their completeness as a consequence.

<http://dx.doi.org/10.1515/ms-2015-0150>

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## Keywords

completeness, GNS representation, Jordan Banach algebras, pure states