Factors generated by $XY$-model with competing Ising interactions on the Cayley tree.

Authors' abstract: In the present paper, we consider a quantum Markov chain corresponding to the $XY$-model with competing Ising interactions on the Cayley tree of order two. Earlier, it was proved that this state does exist and is unique. Moreover, it has clustering property. This means that the von Neumann algebra generated by this state is a factor. In the present paper, we establish that the factor generated by this state may have type $\text{III}_{\lambda}$, $\lambda \in (0,1)$, which is unusual for states associated with models with nontrivial interactions.

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MSC:

- 46L53 Noncommutative probability and statistics
- 46L60 Applications of selfadjoint operator algebras to physics
- 82B10 Quantum equilibrium statistical mechanics (general)
- 81Q10 Selfadjoint operator theory in quantum theory, including spectral analysis
- 46L36 Classification of factors

Keywords:
quantum Markov Chain; XY-model; Cayley tree

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References:


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