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The definition of a quantum Markov state was given by L. Accardi [Funct. Anal. Appl. 9, 1–7 (1975); translation from Funkts. Anal. Prilozh. 9, No. 1, 1–8 (1975; Zbl 0395.60076)]. In the classical case, according to the authors, this definition gives hidden Markov measures, which, generally speaking, are not Markov measures. The authors use a nonnegative transfer matrix to define a Markov measure. They use a positive semidefinite transfer matrix and select a class of quantum Markov states (in the sense of Accardi) on the inductive limit of the $C^*$-algebras $M_{d_n}$. An entangled quantum Markov state in the sense of F. Fidaleo and L. Accardi [Ann. Mat. Pura Appl. (4) 184, No. 3, 327–346 (2005; Zbl 1102.46043)] is a quantum Markov state in their sense. For the case where the transfer matrix has rank 1, they calculate the eigenvalues and the eigenvectors of the density matrices determining the quantum Markov state. The sequence of von Neumann entropies of the density matrices of this state turns out to be bounded.

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MSC:
46L30 States of selfadjoint operator algebras
46L10 General theory of von Neumann algebras

Keywords:
$C^*$-algebra; state on $C^*$-algebra; density matrix; quantum Markov state; von Neumann entropy

Full Text: DOI

References:

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