On non-commutative operator graphs generated by POVMs

Mokeev Aleksandr

Steklov Mathematical Institute of Russian Academy of Sciences

A non-commutative operator graph is a subspace $\mathcal{V}$ in the space $B(H)$ of all bounded linear operators on the Hilbert space H, such that $A \in \mathcal{V}$ implies $A^* \in \mathcal{V}$. Every quantum noise, described as a set of completely positive maps on a space of quantum states, has a correspondent non-commutative operator graph. In terms of that graph, it is possible to formulate the problem of the existence of quantum error-correcting code for the noise, moreover, the problem of the existence of quantum error-correcting codes could be posed for an abstract non-commutative operator graph independently of initial formalism. So it is meaningful to find suitable methods of the description of non-commutative operator graphs that allow us effectively solve the problem of error correction. We will discuss one of those methods, then a graph is linearly generated by some POVM, several of the interesting examples will be given. Also, the opposite problem of the description of quantum noise corresponding to the graph in the proposed parametrization will be considered.

This work is supported by the Russian Science Foundation under grant 17-11-01388.

References

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