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*Fidelity preservation in operator algebras*

The notion of fidelity has its origins in communication theory, where a quantitative measure of the accuracy of information transmission is sought. Not surprisingly, this concept has carried over to quantum information theory and has, in this latter setting, a formulation involving density operators and channels. The question of which channels preserve fidelity was answered by L. Molnar in 2001. Nevertheless, researches have returned to the issue in recent years, tweaking various hypotheses. With the aim of understanding the algebraic content of Molnar's result, I will report on joint work with S. Jaques and M. Rahaman in which we introduce, for unital  $C^*$ -algebras with a faithful tracial state, the notion of fidelity for pairs of positive elements of unit trace. Our main result is a characterisation of the structure of unital positive linear maps on the algebra that preserve fidelity.