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Extreme Points of Unital Quantum Channels

Several new classes of extreme points of unital and trace-preserving completely positive (CP) maps are analyzed. One class is not extreme in either the convex set of unital CP maps or the set of trace-preserving CP maps and is factorizable. Another class is extreme for both the set of unital CP maps and the set of trace-preserving CP maps, except for certain critical parameters. For those parameters the linear dependence of the matrices in the Choi product condition are associated with representations of the symmetric group.

Joint work with U. Haagerup and M. Musat