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Private Quantum Channels, Conditional Expectations, and Trace Vectors

We first briefly review private quantum channels (PQCs), conditional expectations, and trace vectors. We provide a new characterization of single qubit PQCs by considering the Bloch sphere. We introduce trace preserving conditional expectations, which we call conditional expectation channels, and show that a conditional expectation channel is a PQC if and only if the subset on which it is defined is a set of trace vectors for the algebra. Joint work by Amber Church, David W. Kribs, and Rajesh Pereira.