

Introduction to Quantum Channels

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Abstract: I will define a hermitian matrix. I will define a completely positive matrix. I will define a density matrix. I will explain that the eigenvectors of a density matrix correspond to outcomes of experiments. I will use the Stern Gerlach experiment as an example. I will explain that eigenvalues correspond to the probabilities of those outcomes. I will define a quantum channel. I will show that a sum of conjugations by a certain set of matrices gives a channel and conversely define the set of kraus operators of a channel. I will define the Pauli matrices. I will define the Bloch Sphere. I define the King-Ruskai-Szarek-Werner matrix and show that it also represents a channel.