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Types and location of information[1] LOOI SHIANG YONG, VLAD GHEORGHIU, ROBERT B. GRIFFITHS, Carnegie Mellon University — Imagine having some quantum information encoded in n carrier qubits. We are interested in the question of how much information is present in a subset of the carrier qubits. In the case where the encoding is done using a stabilizer code, we have a precise and complete answer. The two extreme cases of having too small a subset whereby no information is present versus having a large subset of almost n qubits from which all the information can be extracted are already well understood. In this talk we focus on the intermediate situation where only partial information is present. For this purpose we define different "types" of information, where the presence of a type of information on a subset of carrier qubits implies the ability to distinguish a particular set of encoded states associated to that type. With this we can determine how much and what types of information are present in any given subset of carrier qubits. With the help of some simple examples, we will show how sometimes only "classical" information is present and sometimes more can be present. Finally our results can be generalized to higher dimensional qudit stabilizer codes.

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