

Abstract Submitted  
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**Making Moderately Large Ancillae** BRYAN EASTIN, University of New Mexico — Block coding has long been hailed as a practical method of decreasing the effective error probability. Compared with concatenated coding, large block codes require fewer encoding qubits to achieve the same logical error rate. The size of the quantum code employed, however, is not the only factor in determining the total number of qubits required. Another important aspect is the efficiency of procedures for constructing ancillary logical states used for computation and error correction. In this regard, block codes are at a disadvantage because there is no known method of efficiently preparing logical ancillae for block codes that does not rely on concatenation. For practical applications, however, it is sufficient to be capable of preparing logical ancillae for codes with large finite block size. This presentation describes a method of making moderately large ancillae with benign error properties. The form of the errors will be discussed as well as the method's resource scaling and the range of parameters for which it is effective.

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