Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

3D local qupit quantum code without string logical operator
ISAAC KIM, Institute of Quantum Information and Matter — Recently Haah introduced a new class of local quantum error correcting code embedded on a cubic lattice without any string logical operator. We present new codes with similar properties by relaxing the condition on the local particle dimension. The resulting code is well-defined when the local Hilbert space dimension is prime. These codes can be divided into two different classes: the local stabilizer generators are either symmetric or antisymmetric with respect to the inversion operation. We lower bound the number of encoded qudits by computing the commutation relation between the logical operators confined on a plane.

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Date submitted: 10 Nov 2011 Electronic form version 1.4