Title:	Automated error correction in IBM quantum computer and explicit generalization
Authors:	Ghosh, Debjit (/jspui/browse?type=author&value=Ghosh%2C+Debjit)
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Abstract:	Construction of a fault-tolerant quantum computer remains a challenging problem due to unavoidable noise and fragile quantum states. However, this goal can be achieved by introducing quantum error-correcting codes. Here, we experimentally realize an automated error correction code and demonstrate the nondestructive discrimination of GHZ states in IBM 5-qubit quantum computer. After performing quantum state tomography, we obtain the experimental results with a high fidelity. Finally, we generalize the investigated code for maximally entangled n-qudit case, which could both detect and automatically correct any arbitrary phase-change error, or any phase-flip error, or any bit-flip error, or combined error of all types of error.
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