Entanglement creation with quantum error correction

Gabriele De Chiara
Scuola Normale Superiore, Piazza dei Cavalieri 7, I-56126

The evolution of two logic qubits, encoded in a register of physical qubits, is studied. It is found that errors induced by interactions with an environment can be corrected by means of standard quantum error correction schemes, which slow down dephasing effects. Furthermore it is found that there can be creation of entanglement even if the two qubits do not interact together. This is due to the correlation of noise at different qubits.