

QUANTUM ERROR CORRECTING CODES

Eda YILDIZ, Research Assistant in Yildiz Technical University

Error correction is necessary during a data transmission. When a message is sent, some errors may occur in the communication channel. Some codes are used to correct these errors. Though classical computers have been developed day by day, a new machine which is based on quantum mechanics and is called quantum computer is expected more powerful than a classical one. In a quantum system, error correction procedure is different from classical one. A distinct approach is needed for error correction since quantum systems are based on quantum mechanics. Hence, a new method based on quantum mechanics should be constructed. There are some differences between quantum and classical error corrections. So, these differences should be considered when a new procedure is performed. In this study, some quantum operations which is used quantum error correcting codes (QECC) are defined. Differences between quantum and classical error correction procedures are mentioned. Also, some types of quantum error correcting codes are analyzed and illustrated with examples.