

Quantum BCH Codes Based on Spectral Techniques

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Abstract: When the time variable in quantum signal processing is discrete, the Fourier transform exists on the vector space of n -tuples over the Galois field F_2 , which plays an important role in the investigation of quantum signals. By using Fourier transforms, the idea of quantum coding theory can be described in a setting that is much different from that seen that far. Quantum BCH codes can be defined as codes whose quantum states have certain specified consecutive spectral components equal to zero and the error-correcting ability is also described by the number of the consecutive zeros. Moreover, the decoding of quantum codes can be described spectrally with more efficiency.

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Key words: Fourier transform, BCH code, quantum error-correction code

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