
SEMINARIO

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Entanglement-assisted quantum error-correcting codes from subfield subcodes of projective Reed-Solomon codes

Abstract: Considering subfield subcodes of linear codes is a standard technique for constructing long linear codes over a small finite field. For instance, BCH codes can be obtained in this way from Reed-Solomon codes. The main problem when considering subfield subcodes is computing the dimension and obtaining a basis for the subfield subcode. In this talk we focus on projective Reed-Solomon codes, and we obtain bases for both the subfield subcodes and their duals. This knowledge over the primary and the dual codes allows us to construct both symmetric and asymmetric entanglement-assisted quantum error-correcting codes, which in many cases have new or better parameters than the ones available in the literature. Moreover, with this approach from evaluation codes, we can also evaluate in different sets of points, for instance the roots of a trace function. In this way we are able to obtain classical linear codes with record parameters according to codetables.de, and new quantum codes.

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