



Asymptotically good binary linear codes with asymptotically good self-intersection spans

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(Submitted on 13 Apr 2012 (v1), last revised 31 Aug 2012 (this version, v3))

If C is a binary linear code, let C^2 be the linear code spanned by intersections of pairs of codewords of C . We construct an asymptotically good family of binary linear codes such that, for C ranging in this family, the C^2 also form an asymptotically good family. For this we use algebraic-geometry codes, concatenation, and a fair amount of bilinear algebra.

More precisely, the two main ingredients used in our construction are, first, a description of the symmetric square of an odd degree extension field in terms only of field operations of small degree, and second, a recent result of Garcia-Stichtenoth-Bassa-Beelen on the number of points of curves on such an odd degree extension field.

Comments: 18 pages; v2->v3: expanded introduction and bibliography + various minor changes

Subjects: **Information Theory (cs.IT)**; Combinatorics (math.CO)

Cite as: [arXiv:1204.3057](#) [cs.IT]

(or [arXiv:1204.3057v3](#) [cs.IT] for this version)

Submission history

From: Hugues Randriam [\[view email\]](#)

[\[v1\]](#) Fri, 13 Apr 2012 17:24:00 GMT (13kb)

[\[v2\]](#) Mon, 23 Apr 2012 16:25:34 GMT (13kb)

[\[v3\]](#) Fri, 31 Aug 2012 17:44:59 GMT (16kb)

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