Cyclic additive codes and cyclic quantum stabilizer codes

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The theory of cyclic linear codes in its ring-theoretic formulation is a core topic of classical coding theory. A simplified approach is in my textbook [1]. The language of ring theory is not needed. We will present a self-contained description of the more general theory of cyclic additive codes using the same method. This includes cyclic quantum stabilizer codes as a special case. The basic ingredients needed are finite field extensions, their Galois groups, the trace, cyclotomic cosets, Lagrange interpolation and bilinear forms, not more. This is based on the paper [2].

References

[1] J. Bierbrauer: *Introduction to Coding Theory, Chapman and Hall/CRC Press*, 2004.

[2] Cyclic additive and quantum stabilizer codes, *Arithmetic of finite fields, WAIFI, Madrid 2007 (C. Carlet and B. Sunar, Eds.), Lecture Notes in Computer Science 4547 (2007)*, 276-283.