Essencial idempotents in group algebras and coding theory

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We introduce the concept of essencial idempotents in group algebras, a notion inspired in coding theory. We shall give some criteria to identify which primitive idempotents are essential, and discuss some applications. Among these, we show that every minimal non-cyclic abelian code is a repetition code, and that every minimal abelian code is combinatorially equivalent to a cyclic code of the same lenth. Also, we shall give an example showing that a non minimal abelian code of lenth p^2 with p a prime integer, can be more convenient than any cyclic code of that length.