

ALGEBRAIC GEOMETRY CODES AND ELKIES CODES

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Error control codes are widely used to increase the reliability of transmission of information over various forms of communications channels. *Algebraic geometry (AG)* codes were introduced by V. Goppa in the 1980's. The codewords in an AG code are obtained by evaluating functions at the points of an algebraic curve over a finite field; Goppa's construction produces some of the best codes currently known. N. Elkies has recently proposed a generalization of this construction that produces non-linear codes with even better parameters. Their non-linearity is a serious drawback for their use in applications. Our research involves analyzing Elkies codes on the line and on Hermitian curves over finite fields. We show that Elkies codes contain relatively large linear subcodes, and examine the codeword recognition problem using properties of these linear subcodes.