Abstract

Let \$q\$ be a power of a prime and \$\Ff q\$ denote the finite field with \$q\$ elements. An \$[n,k,d]\$ linear code over Ff q is a k-dimensional subspace of $Ff q^n$ with minimum Hamming distance \$d\$. Let \$\Ff q^n\$ stand for the vector space with dimension \$n\$ over \$\Ff_q\$. Maximum distance separable (MDS) codes are optimal in the sense that no code of length \$n\$ with \$K\$ codewords has a larger minimum distance than that of a MDS code with length \$n\$ and size \$K\$. Mathematically, an [n,k,d] code $\cs is$ called a MDS code if n=k+d-1. The purpose of this paper is to construct linear codes from generalized Reed-Solomon (GRS) codes or extended generalized Reed-Solomon codes and determine their hull. Inspired by the idea of [6], we propose several constructions of MDS codes with hulls of arbitrary dimensions. Furthermore, by using these MDS codes with hulls of arbitrary dimensions, we obtain several new infinite families of MDS EAQECCs.