Mixed MDS Codes

Let $\mathbb{F}_q^m$ denote the vector space of dimension $m$ over the Galois field $\mathbb{F}_q$. A $k$-independent set of subspaces (k-ISS) of $\mathbb{F}_q^m$ is a set $\mathcal{S}$ of subspaces in $\mathbb{F}_q^m$ such that $|\mathcal{S}| \geq k$ and any subset of $k$ subspaces of $\mathcal{S}$ is independent.

In a previous DiscMath talk, we have seen that a k-ISS can be used to construct a mixed code $C$ with minimum Hamming distance at least $k + 1$ and covering radius of $C$ is at most $k - 1$.

In this talk, we will discuss the conditions under which $C$ has the maximum possible cardinality among all mixed codes with the same parameters (length and minimum distance), i.e., when $C$ is Maximum Distance Separable (MDS).