Abstract

The hull of a linear code over finite fields is the intersection of the code and its dual, which was introduced by Assmus and Key. In this talk, we introduce a new method for conatructing linear codes with small hulls. Specifically, we develop a method to construct linear codes with trivial hull (LCD codes) and one-dimensional hull by employing the positive characteristic analogues of Gauss sums. These codes are quasi-abelian, and sometimes doubly circulant. Some sufficient conditions for a linear code to be an LCD code (resp. a linear code with one-dimensional hull) are presented. It is worth mentioning that we present a lower bound on the minimum distances of the constructed linear codes. As an application, using these conditions, we obtain some optimal or almost optimal LCD codes (resp. linear codes with one-dimensional hull) with respect to the online Database of Grassl. This is a joint work with Liqin Qian.