On Blocking Sets in Steiner systems and G-designs

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Abstract

Blocking sets are particular types of transversals in hypergraphs. In all our considerations, we assume that any edge of a hypergraph has the cardinality at least two, i.e. $|E| \geq 2$.

Steiner Systems, denoted by $S_\lambda(h, k, v)$ constitute an important class of uniform and regular hypergraphs. We show that blocking sets do not exist in any $STS(v)$, except one trivial case of $STS(3)$.

We then discuss on theorems that give a relation between the order v of an Steiner Systems and the cardinality p of a possible blocking set. Moreover, we introduce the concept of *perfect* blocking sets in G-designs and determine all the possible v for which there exist P_3-designs having perfect blocking sets.