Title: Transversals in hypergraphs.

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Abstract:

We will give a short survey of recent published and unpublished results on transversals in hypergraphs together with some applications. A hypergraph is a generalization of a graph, in the sense that hyperdges can contain any number of vertices and not just two as in a graph. If all hyperedges contain k vertices the hypergraph is called k-uniform and if every vertex belongs to r edges the hypergraph is r-regular. If every pair of hyperedges intersect in at most one vertex the hypergraph is called linear. A *transversal* in a hypergraph is a set of vertices intersecting every hyperedge and the transversal number, $\tau(H)$, of a hypergraph, H, denotes the minimum size of a transversal. We will discuss recent progress on the following two conjectures.

Tuza-Vestergaard Conjecture: Every 6-uniform 3-regular hypergraph, H, on n vertices has $\tau(H) \leq n/4$.

Conjecture: Every linear 4-uniform hypergraph, H, on n vertices and with m edges has $\tau(H) \leq \frac{n+m}{5}$.

We will furthermore discuss generalizations and consequences of the above conjectures as well as related conjectures, applications and corollaries.