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Duplicated Steiner triple systems with self-orthogonal near resolutions

A Steiner triple system, $\text{STS}(v)$, is a family of 3-subsets (blocks) of a set of v elements such that any two elements occur together in precisely one block. A collection of triples consisting of two copies of each block of an STS is called a duplicated Steiner triple system, DSTS. A resolvable (or near resolvable) DSTS is called self-orthogonal if every pair of distinct classes in the resolution has at most one block in common. We provide several methods to construct self-orthogonal near resolvable DSTS and almost completely settle the existence of such designs. At present, there is one remaining possible exception for v . This addresses a recent question of Bryant, Davies and Neubecker. This is joint work with Peter Dukes.