Abstract

Super-simple designs

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A $2 - (v, k, \lambda)$-design is a pair (V, B), where V is a v-element set of points and B is a collection of k-element subsets of V called blocks such that every pair of points is in exactly λ blocks. A (v, k, λ)-design (V, B) is **super-simple** if any two blocks intersect in at most 2 points. The concept of super-simple designs was introduced by Mullin and Gronau in 1990. In the talk we give a survey of the present status of the study of the spectrum of super-simple designs. We also show that a super-simple $(v, 5, 2)$-design exists if and only if $v = 1$ *or* $5 \bmod 10$, except definitely when $v = 5, 15$ and possibly when $v = 75, 95, 115, 135, 195, 215, 231, 285, 365, 385, 515,$ what is joint work with Kreher and Ling. We add results by Hartmann on the asymptotic existence of super-simple designs and new results by Abel Bennett, who excluded a few cases in doubt.