Abstract

Construction of t-(v, k, λ) designs with prescribed automorphism group

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We shall present a new approach in construction of t-(v, k, λ) designs. In the last few years, my supervisor Mario-Osvin Pavčević and Vedran Krčadinac, in collaboration with other associates, successfully combined the well known Kramer-Mesner method and tactical decomposition and *indexing* approach in order to construct new t-(v, k, λ) designs admitting an action of an automorphism group. In the past, tactical decomposition and *indexing* have been used for sporadic constructions of 2-designs. On the other hand, the Kramer-Mesner algorithm was broadly used for the construction of t-designs. It is now clear that information provided by tactical decomposition matrices can enhance the Kramer-Mesner method. This new combination of two approaches can in many cases dramatically reduce the size of the Kramer-Mesner matrix and therefore t-designs can be constructed faster and more easily. Moreover, this new method can also be used to construct other combinatorial structures with weaker properties, like symmetric configurations. We shall present an outline of this new technique as well as some new results for t-designs.

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