

Symmetric designs, difference sets and Hadamard matrices

Talk

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The relationship between symmetric designs and difference sets is similar to the relation between $(4t, 2, 4t, 2t)$ -relative difference sets and cocyclic Hadamard matrices. It is also known that $(4t - 1, 2t - 1, t - 1)$ -difference sets give rise to Hadamard matrices.

I will provide all necessary definitions and an overview of cocyclic development. I will show that a Hadamard matrix supporting both the structure of a difference set and a relative difference set necessarily has a doubly transitive automorphism group. An application of the classification of finite simple groups then supplies a classification of the Hadamard matrices developed from difference sets which are also cocyclic.

MSC2010: 05B10, 05B20, 20B20, 20B25.

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