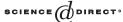


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Maximal arc partitions of designs

A.N. Al-Kenani^a, V.C. Mavron^b

^aDepartment of Mathematics, King Abdulaziz University, P.O. Box 80219, Jeddah 21589, Saudi Arabia ^bDepartment of Mathematics, The University of Wales, Penglais, Aberystwyth, Ceredigion, Wales SY23 3BZ, UK

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Abstract

It is known that the designs $PG_{n-1}(n,q)$ in some cases have spreads of maximal α -arcs. Here a α -arc is a non-empty subset of points that meets every hyperplane in 0 or α points. The situation for designs in general is not so well known. This paper establishes an equivalence between the existence of a spread of α -arcs in the complement of a Hadamard design and the existence of an affine design and a symmetric design which is also the complement of a Hadamard design. © 2005 Elsevier B.V. All rights reserved.

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1. Introduction

An α -arc in a 2-design is a subset of points that meets every block in either 0 or α points. [7,8].

Rahilly [6] established the equivalence of the existence of an affine design of class number 4 and a Hadamard 2-design possessing a spread of lines of maximum size 3. By observing that a line of maximum size 3 in a Hadamard design is a 1-arc in the complementary design, we are able to extend this result and to state it in the language of maximal arcs in designs.

E-mail addresses: aalkenani10@hotmail.Com (A.N. Al-Kenani), vcm@aber.ac.uk (V.C. Mavron).