

Embedding of orthogonal Buekenhout-Metz unitals in the Desarguesian plane of order q^2

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Abstract

A unital, that is a $2-(q^3 + 1, q + 1, 1)$ block-design, is embedded in a projective plane π of order q^2 if its points are points of π and its blocks are subsets of lines of π , the point-block incidences being the same as in π . Regarding unitals \mathcal{U} which are isomorphic, as a block-design, to the classical unital, T. Szőnyi and the authors recently proved that the natural embedding is the unique embedding of \mathcal{U} into the Desarguesian plane of order q^2 . In this paper we extend this uniqueness result to all unitals which are isomorphic, as block-designs, to orthogonal Buekenhout-Metz unitals.

Keywords: Unital, embedding, finite Desarguesian plane.

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Vložitev ortogonalnih Buekenhout-Metzovih unitalov v Desarguesovo ravnino reda q^2

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Povzetek

Unital, to je 2 - $(q^3 + 1, q + 1, 1)$ bločni načrt, je vložen v projektivno ravnino π reda q^2 , če se njegove točke slikajo v točke projektivne ravnine π , njegovi bloki se slikajo v podmnožice premic projektivne ravnine π , incidence med točkami in bloki pa so iste kot v π . Za unitala \mathcal{U} ki so, kot bločni načrti, izomorfní klasičnim unitalom, so T. Szőnyi ter avtorji nedavno dokazali, da je naravna vložitev edina obstoječa vložitev \mathcal{U} v Desarguesovo ravnino reda q^2 . V tem članku razširimo ta enoličnostni rezultat na vse unitala, ki so, kot bločni načrti, izomorfní ortogonalnim Buekenhout-Metzovim unitalom.

Ključne besede: Unital, vložitev, končna Desarguesova ravnina.

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