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Locally spherical hypertopes from generalised cubes*

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Abstract

We show that every non-degenerate regular polytope can be used to construct a thin, residually-connected, chamber-transitive incidence geometry, i.e. a regular hypertope. These hypertopes are related to the semi-regular polyotopes with a tail-triangle Coxeter diagram constructed by Monson and Schulte. We discuss several interesting examples derived when this construction is applied to generalised cubes. In particular, we produce an example of a rank 5 finite locally spherical proper hypertope of hyperbolic type. No such examples were previously known.

Keywords: Regularity, thin geometries, hypermaps, hypertopes, abstract polytopes.

Math. Subj. Class.: 52B15, 51E24, 51G05

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Lokalno sferični hipertopi, dobljeni iz posplošenih kock*

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Povzetek

Pokažemo, da lahko iz vsakega nedegeneriranega pravilnega politopa konstruiramo tanko, residualno povezano, komorno tranzitivno incidenčno geometrijo oz. pravilni hipertop. Ti hipertopi so povezani s polpravilnimi politopi z repno trikotnim Coxeterjevim diagramom, ki sta ga konstruirala Monson in Schulte. Obravnavamo več zanimivih primerov, ki jih dobimo, ko to konstrukcijo uporabimo na posplošenih kockah. Še posebej, predstavimo primer končnega lokalno sferičnega pravilnega hipertopa hiperboličnega tipa ranga 5. Noben tak primer ni bil znan doslej.

Ključne besede: Pravilnost, tanke geometrije, hiperzemljevidi, hipertopi, abstraktni politopi.

Math. Subj. Class.: 52B15, 51E24, 51G05

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