

Pappus's Theorem in Grassmannian $Gr(3, \mathbb{C}^n)$

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Abstract

In this paper we study intersections of quadrics, components of the hypersurface in the Grassmannian $Gr(3, \mathbb{C}^n)$ introduced by S. Sawada, S. Settepanella and S. Yamagata in 2017. This lead to an alternative statement and proof of Pappus's Theorem retrieving Pappus's and Hesse configurations of lines as special points in the complex projective Grassmannian. This new connection is obtained through a third purely combinatorial object, the intersection lattice of Discriminantal arrangement.

Keywords: Discriminantal arrangements, intersection lattice, Grassmannian, Pappus's Theorem.

Math. Subj. Class.: 52C35, 05B35, 14M15

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Pappusov izrek v Grassmannovem prostoru $Gr(3, \mathbb{C}^n)$

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Povzetek

V tem članku študiramo preseke kvadrikov, komponent hiperploskve v Grassmanovih prostorih $Gr(3, \mathbb{C}^n)$, ki so jih vpeljali S. Sawada, S. Settepanella in S. Yamagata leta 2017. To vodi k alternativni formulaciji in dokazu Pappusovega izreka, ki Pappusovo in Hessejevo konfiguracijo premic predstavi kot posebni točki v kompleksnem projektivnem Grassmannovem prostoru. To novo povezavo dobimo s pomočjo tretjega povsem kombinatoričnega objekta, presečne mreže diskriminantnega sestava.

Ključne besede: Diskriminantni sestavi, presečne mreže, Grassmannov prostor, Pappusov izrek.

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