

## EIGHTH CONFERENCE

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GIUSEPPE VERONESE AND ERNST WITT — NEIGHBOURS IN  $\text{PG}(5, 3)$

Let  $P$  be a fixed point of the *Veronese surface*  $\mathcal{V}$  in  $\text{PG}(5, 3)$ . Then there are four conics of  $\mathcal{V}$  through  $P$ . We show that the internal points of those conics form a 12-cap  $\mathcal{K}$  which is a point model for Witt's 5-(12, 6, 1) design  $W_{12}$ . We give an explicit parametrization of the cap  $\mathcal{K}$ ; the domain is a dual affine plane which arises from  $\text{PG}(2, 3)$  by removing one point. Although the parametric representation is in terms of homogeneous coordinates, one of its coordinate functions contains an inhomogeneous term, something which usually does not make sense. But here it is meaningful, since 1 is the only nonzero square in  $\text{GF}(3)$ . As a by-product, we obtain an easy approach to the extended ternary *Golay code*  $G_{12}$ . Finally, we discuss some other procedures that yield 12-sets of points from the Veronese surface  $\mathcal{V}$ .

### References:

- [1] HAVLICEK, H.: *The Veronese Surface in  $\text{PG}(5, 3)$  and Witt's 5-(12, 6, 1)-design*, J. Comb. Theory Ser. A **84** (1998), 87–94.
- [2] HAVLICEK, H.: *Giuseppe Veronese and Ernst Witt – Neighbours in  $\text{PG}(5, 3)$* , Aequationes Math., in print.