Regular partitions of (weak) finite generalized polygons

A. De Wispelaere* H. Van Maldeghem

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Abstract

We define a *regular m-partition* of a distance regular graph as a partition of the vertex set into m classes, such that the number of vertices of a given class adjacent to a fixed vertex of another class (but possibly the same), is independent of the choice of that vertex in this class. Furthermore, we exhibit a technique to determine exact, discrete or bounding values for the intersection numbers of two such regular partitions of a DRG. As an application, we perform a structural investigation on the substructures of finite generalized polygons and, besides some new results, we give unifying, alternative and more elegant proofs of the results in [1] and [2].

References

[1] A. Offer, On the order of a generalized hexagon admitting an ovoid or spread, *J. Combin. Theory Ser. A* **97** (2002), 184 – 186.

[2] A. Offer & H. Van Maldeghem, Distance-j ovoids and related structures in generalized polygons, *Discr. Math.* **294** (2005), 147 – 160.

*The first author is a Postdoctoral Fellow of the Fund for Scientific Research - Flanders (Belgium) (F.W.O.)