

The Research on Circle Family and Sphere Family

The Original Topic:

**The Research and Generalizations on Several Kinds of Partition
Problems in Combinatorics**

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【Abstract】

A circle family is a group of separated or tangent circles in the plane. In this paper, we study how many parts at most a plane can be divided by several circle families if the circles in a same family must be separated (resp. if the circles can be tangent). We also study the necessary conditions for the intersection of two circle families. Then we primarily discuss the similar problems in higher dimensional space and in the end, raise some conjectures.

【Key words】

Circle Family; Structure Graph; Sphere Family; Generalized Inversion