

# Decomposing multiple coverings

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## Abstract

Let  $\mathcal{C} = \{ C_i \mid i \in I \}$  be a collection of planar sets. It is an *m-fold covering* if every point in the plane is contained in at least  $m$  members of  $\mathcal{C}$ . The investigation of structural properties of multiple coverings was initiated by László Fejes Tóth. A planar set  $C$  is said to be cover-decomposable if the following holds. There exists a constant  $m = m(C)$  such that every  $m$ -fold covering of the plane with translates of  $C$  can be decomposed into two coverings.

János Pach conjectured that all convex sets are cover-decomposable. This conjecture has been verified in two special cases.

(J. Pach, P. Mani-Levitska, 1986) *The unit disc is cover-decomposable.*

(J. Pach, 1986) *Every centrally symmetric convex polygon is cover-decomposable.*

In this talk we generalize the second result and show that every convex polygon is cover-decomposable.

Joint work with Gábor Tardos.

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