

Which set minimizes the area with fixed minimal length of a bisecting chord? An answer for Zindler sets

Aldo Pratelli

Dipartimento di Matematica “F. Casorati”,
Università di Pavia
(aldo.pratelli@unipv.it)

Abstract

Let us consider a convex planar set E : among all the chords bisecting the area, there is a minimal one. An old problem (presented also in the book “Unsolved problems in Geometry”, 1991, and known as “Santaló problem”) is the following: if we fix this minimal length, which set has the smallest possible area? It is reasonable to guess that this set must be the ball, but thanks to the work of Zindler (1921) it is known that it is not so. In particular, Zindler shows that there are sets which have all the bisecting chords of the same length, and which are smaller than the ball: these sets are often referred to as Zindler sets. A big work has been done in last decades to study the properties of the convex sets with respect to the minimal bisecting length, in particular in the case of Zindler sets, but the problem of Santaló is still open. We give the answer of this problem in the class of Zindler sets.