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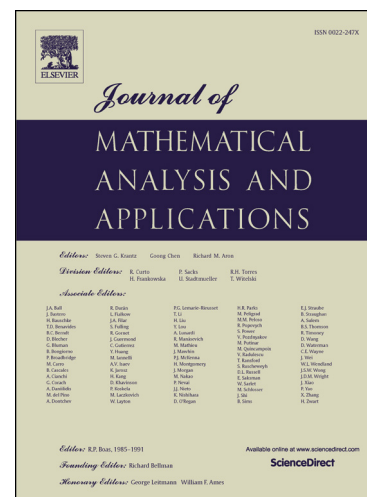
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# Convexity constant of a domain and applications

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## Abstract

In the present paper we introduce a new characterization of the convexity of a planar domain, based on the convexity constant  $K(D)$  of a domain  $D \subset \mathbb{C}$ .

We show that in the class of simply connected planar domains,  $K(D) = 1$  characterizes the convexity of the domain  $D$ , and we derive the value of the convexity constant for some classes of doubly connected domains of the form  $D_\Omega = D - \bar{\Omega}$ , for certain choices of the domains  $D$  and  $\Omega$ .

Using the convexity constant of a domain, we derive an extension of the well-known Ozaki-Nunokawa-Krzyz univalence criteria for the case of non-convex domains, and we present some examples, which show that our condition is sharp.

*Keywords:* convex set, convexity constant of a domain, univalent function, univalence criteria.

*2000 MSC:* 52A10, 52A30, 30C45

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## 1. Introduction

Convexity of a planar domain plays an important notion in many areas of mathematics. With respect to this notion, the class of planar domains can be divided into two classes: the class of convex domains and the class of non-convex domains, but there is no continuous way of passing between the

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