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### **Abstracts**

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The materials are intended for researchers, teachers, graduate undergraduates and senior students specializing in various areas of mathematics and its applications.

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## MITYUK AND HAYMAN RADII FOR MULTIPLY CONNECTED DOMAINS

A.V. Kazantsev<sup>1</sup>, M.I. Kinder<sup>2</sup>

<sup>1</sup> avkazantsev63@gmail.com; Kazan, Russia

<sup>2</sup> detkinm@gmail.com; Kazan, Russia

Let  $D$  be a multiply connected domain. The Mityuk conformal radius of the domain  $D$  at a point  $w \in D$  has the form  $R(w) = 1/|\varphi(w, w_0)|$ , where  $F(w, w_0) = (w - w_0)\varphi(w, w_0)$  is the holomorphic univalent function that maps  $D$  onto the canonical domain, the unit disk  $\Delta$  with circular concentric cuts ([1]; see also [2]). The inner Hayman radius of the domain  $D$  at a point  $w \in D$  is defined as  $r(w) = e^{g(w, w_0)}$ , where  $G(w, w_0) = -\ln|w - w_0| + g(w, w_0)$  is the Green function of the domain  $D$  [3].

Extension of the class of canonical domains by adding radial cuts to  $\Delta$  entails a change of the construction of both types of radii, conformal and inner, which, in this setting, will be called generalized and denoted, respectively, by  $M(w)$  and  $m(w)$ . So, the generalized inner radius of the domain  $D$  will be defined as  $m(w) = e^{s(w, w_0)}$ , where

$$S(w, w_0) = -\ln|w - w_0| + s(w, w_0)$$

is an analogue of the Green and Neumann function of the region  $D$ .

We discuss the properties of both types of generalized radii, such as the existence of critical points, the relationship of their number with the order of connectivity of a domain, the applications in the inverse boundary value problems, and some others. In particular, we have the following

**Theorem.** *The generalized Mityuk conformal radius of an  $(n + 1)$ -connected domain  $D$  with analytic boundary has at least one critical point. In the case  $n = 1$  there are examples of doubly connected domains  $D$  for which the equation  $\partial M/\partial w = 0$  has no solutions.*

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