

Kud'yavin, V. S.

A characteristic property of a class of space homeomorphisms. (Russian) Zbl 0725.30010
Questions of analysis and approximation, Collect. Sci. Works, Kiev, 81-88 (1989).

[For the entire collection see [Zbl 0685.00003](#).]

This is a short note on particular properties of some classes of homeomorphisms $f: D \rightarrow D^*$ between bounded open sets in \mathbb{R}^n . A pair (E, G) consisting of an open set G in \mathbb{R}^n and a subset $E \subset G$ compact in \mathbb{R}^n is called a condensator. For any α with $1 \leq \alpha \leq n$, such a condensator has a real-valued α -capacity which is defined by an infimum of integrals over G , taken over a certain class of functions $\phi: G \rightarrow [0, 1]$. Theorem 1 of this paper says that a homeomorphism $f: D \rightarrow D^*$ is almost everywhere differentiable in D if f satisfies certain inequalities with respect to the α -capacities of condensators (E, G) in D , i.e., $E \subset G \subseteq D$. The second part of the paper deals with characteristic values attached to homeomorphisms $f: D \rightarrow D^*$, which are defined by particular integrals (over D) of functions constructed from (pointwise) generalized derivatives of f . Theorem 2 gives then a characterization of those homeomorphisms that have prescribed bounded characteristic integrals in the above sense. The equivalent conditions are expressed in terms of (then existing) quasi-additive set-valued functions on D , which satisfy boundedness conditions for condensators in D .

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MSC:

- [30C65](#) Quasiconformal mappings in \mathbb{R}^n , other generalizations
- [26D10](#) Inequalities involving derivatives and differential and integral operators
- [26E25](#) Set-valued functions
- [54C30](#) Real-valued functions in general topology

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