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Local and global inversion theorems without assuming continuous differentiability. (English)

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The main result of this article is the following Theorem 1: Let $n \geq 3$, $D \subset \mathbb{R}^n$ be open, $K \subset D$ such that $K \neq D$. Let $K = \cap_{p=1}^{\infty} K_p$, where K_p is a closed set for every p, f: $D \to \mathbb{R}^n$ continuous and light such that $m_{n-2}(f(K_p)) = 0$ for every $p \in \mathbb{N}$ and the function f is differentiable on $D \setminus K$ and $J_f(x) \neq 0$ for every $x \in D \setminus K$. Then f is a local homeomorphism on D. As corollaries of this result the author obtains some theorems about global homeomorphisms. For example, Theorem 4. Let $n \geq 3$, E, F be open and pathwise connected and $K \subset E$ such that $K \neq E$. $K = \cap_{p=1}^{\infty} K_p$, where K_p is a closed set for every p, f: $E \to F$ is continuous, closed and light such that $m_{n-2}(f(K_p)) = 0$ for every $p \in \mathbb{N}$ and f is differentiable on $E \setminus K$ and $J_f(x) \neq 0$ for every $x \in E \setminus K$. Then f: $E \to F$ is a global homeomorphism.

MSC:

30C65 Quasiconformal mappings in $\mathbb{R}^n$, other generalizations