Apanasov, Boris N.

Quasisymmetric embeddings of a closed ball inextensible in neighbourhoods of any boundary points. (English) Zbl 0747.30016

Ann. Acad. Sci. Fenn., Ser. A I, Math. 14, No. 2, 243-255 (1989).

For a set X in the n-dimensional Euclidean space $\mathbb{R}^n$, an embedding $f\colon X\to\mathbb{R}^n$ is called quasisymmetric if there is a homeomorphism $c\colon[0,\infty)\to[0,\infty)$ such that $|f(y)-f(x)|\le c(r)|f(z)-f(x)|$ for all $x,y,z\in X$ with $|y-x|\le r|z-x|$. In the case $n=2$, it is well known that every quasisymmetric embedding of a closed disc $\overline{B^2}$ into $\mathbb{R}^2$ can be extended to a quasiconformal automorphism of $\mathbb{R}^2$.

On the other hand, *F. W. Gehring* [Tr. Mezhdunarod. Kongr. Mat., Moskva 1966, 313–318 (1968; Zbl 0193.03803)] proved that there are quasisymmetric embeddings of a closed ball B^3 into $\mathbb{R}^3$ which cannot be extended to embeddings of an open neighborhood U of B^3.

In this paper, the author constructs a quasisymmetric embedding of a closed ball B into $\mathbb{R}^3$ which is quasiconformal inside B and cannot be extended to an embedding of any neighborhood of any boundary point of B. In his argument he constructs a geometrically finite Kleinian group acting on $\mathbb{R}^3$ whose limit set is a wildly knotted sphere and uses an ingenious construction of the spherical covering.

Reviewer: T. Kuroda (Sendai) (M.R. 91a:30016)

MSC:

30C65	Quasiconformal mappings in $\mathbb{R}^n$, other generalizations	Cited in **2** Reviews
30F40	Kleinian groups (aspects of compact Riemann surfaces and uniformization)	Cited in **5** Documents

Keywords:

quasisymmetric embedding; Kleinian group

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