H. YAMAMOTO
KODAI MATH. J.
14 (1991), 350—357

INNER RADII OF TEICHMÜLLER SPACES OF FINITELY GENERATED FUCHSIAN GROUPS

BY HIRO-O YAMAMOTO

1. Introduction

Let Γ be a Fuchsian group keeping the lower half plane L invariant. The Teichmüller space $T(\Gamma)$ of Γ is a bounded domain of the Banach space $B(L, \Gamma)$ of bounded quadratic differentials for Γ. The inner radius $i(\Gamma)$ of $T(\Gamma)$ is the radius of the maximal ball in $B(L, \Gamma)$ centered at the origin which is included in $T(\Gamma)$. If $T(\Gamma)$ is not a single point, then by a theorem of Ahlfors-Weill [3] it holds that $i(\Gamma)\geqq 2$. In particular, if Γ is finitely generated of the first kind and if $T(\Gamma)$ is not a single point, then the strict inequality $i(\Gamma)>2$ holds (cf. [10]). Denote by $I(\Gamma)$ $\inf i(W\Gamma W^{-1})$, where the infimum is taken over for all quasiconformal automorphisms W of the upper half plane compatible with Γ. Recently T. Nakanishi [10] proved the following.

THEOREM 1 (T. Nakanishi). *Let Γ qe a finitely generated Fuchsian group of the first kind such that $T(\Gamma)$ is not a single point. Then $I(\Gamma)$ is equal to* 2.

The purpose of this note is to prove the following generalization to Theorem 1.

THEOREM 2. *Let Γ be a finitely generated Fuchsian group such that $T(\Gamma)$ is not a single point. Then $I(\Gamma)$ is equal to* 2.

The proof of Theorem 2 is immediate from Theorem 1 and the following.

THEOREM 3. *Let Γ be a finitely generated Fuchsian group of the second kind. Then $i(\Gamma)$ is equal to* 2.

A careful reading of the proof of Theorem 3 shows the readers an alternative proof of Theorem 1, though we omit it. Our proof of Theorem 3 depends on results on B-groups [1], [4] and Koebe groups [9].

The author expresses his hearty thanks to the referee and Professor H. Sekigawa for their pointing out a lot of errors in the original manuscript of this note.

Received September 13, 1990; revised December 21, 1990.