SINGULAR SETS OF SOME KLEINIAN GROUPS (II)

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Dedicated to Professor K. Noshiro on his sixtieth birthday

Introduction

In the theory of automorphic functions it is important to investigate the properties of the singular sets of the properly discontinuous groups. But we seem to know nothing about the size or structure of the singular sets of Kleinian groups except the results due to Myrberg and Akaza [1], which state that the singular set has positive capacity and there exist Kleinian groups whose singular sets have positive 1-dimensional measure. In our recent paper [2], we proved the existence of Kleinian groups with fundamental domains bounded by five circles whose singular sets have positive 1-dimensional measure and presented the problem whether there exist or not such groups in the case of four circles. The purpose of this paper is to solve this problem. Here we note that, by Schottky's condition [4], the 1-dimensional measure of the singular set is always zero in the case of three circles.

In §§1-3 we shall give the more extensive criterion than that of the former paper [2] for the singular sets of the Kleinian groups to have positive 1-dimensional measure and define the general computing functions of order ν on a Kleinian group. In §4, using these computing functions we shall give the example which solves the problem.

§1. Kleinian groups and isometric circles of linear transformations

1. Consider the properly discontinuous groups G of the linear transformations which have the fundamental domain B_0 bounded by N mutually disjoint circles $\{K_i\}_{i=1}^{N}$. Then there exist two different kinds of generators. A generator S_{i_0} of the first kind transforms the outside of a boundary circle K_{i_0} onto the inside of a boundary circle K'_{i_0} different from K_{i_0} and a generator S_{j_0} of the second kind transforms the outside of K_{j_0} onto the inside of K_{j_0} itself. The former