

DEFORMATIONS OF HYPERBOLIC 3-CONE-MANIFOLDS

SADAYOSHI KOJIMA

Abstract

We show that any compact orientable hyperbolic 3-cone-manifold with cone angles at most π can be continuously deformed to a complete hyperbolic manifold homeomorphic to the complement of the singularity. This together with the local rigidity by Hodgson and Kerckhoff implies the global rigidity for compact orientable hyperbolic 3-cone-manifolds under the same angle assumption.

0. Introduction

A hyperbolic 3-cone-manifold is a riemannian 3-manifold of constant negative sectional curvature with cone-type singularity along simple closed geodesics (see [7], [8]). To each component of the singularity, is associated a cone angle. The cone angle is a positive real number and possibly attains 2π . In this particular case, the singular set is not singular and simply a finite union of disjoint simple closed geodesics. The hyperbolic 3-cone-manifold is a generalization of the hyperbolic 3-orbifold with vertexless singularity.

We are concerned with the deformations of a hyperbolic 3-cone-manifold with constant topological type. The hyperbolic Dehn filling theory by Thurston in [14], which describes deformations of a complete hyperbolic manifold in more wild setting, is a pioneering work of this

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