Long, D. D.; Reid, A. W.  
Commensurability and the character variety. (English) Zbl 0962.57006  

Two hyperbolic 3-manifolds $M$ and $N$ are said to be commensurable if they have a common finite sheeted covering. Denote by $Y(M)$ the $\text{PSL}(2,\mathbb{C})$-character variety of $M$ and $Y_0(M)$ a component of $Y(M)$ containing the character of a faithful discrete representation of $\pi_1(M)$. The main results of this paper concern how $Y_0(M)$ can be used to detect incommensurability of hyperbolic 3-manifolds. For example, the following theorems were proved.

Theorem 1.1. Suppose that $M_1$ and $M_2$ are 1-cusped hyperbolic 3-manifolds that cover a common orbifold with a flexible cusp. Then $Y_0(M_1)$ is birational to $Y_0(M_2)$.

Theorem 1.2. Suppose that $M$ is a non-arithmetic 1-cusped hyperbolic 3-manifold for which the minimal element in the commensurability class has a flexible cusp. Then $Y_0(M)$ is an invariant of the commensurability class of $M$.

Some other theorems are also proved under the above mentioned aspect.

Reviewer: Lixin Liu (Guangzhou)

MSC:
- 57M50 General geometric structures on low-dimensional manifolds
- 20G99 Linear algebraic groups and related topics
- 57N10 Topology of general 3-manifolds (MSC2010)

Keywords:
- hyperbolic 3-manifold

Full Text: DOI