

Accepted Manuscript

$PSL_2(\mathbb{C})$ -character varieties and Seifert fibered cosmetic surgeries

Huygens C. Ravelomanana

PII: S0166-8641(18)30307-9
DOI: <https://doi.org/10.1016/j.topol.2018.07.006>
Reference: TOPOL 6504

To appear in: *Topology and its Applications*

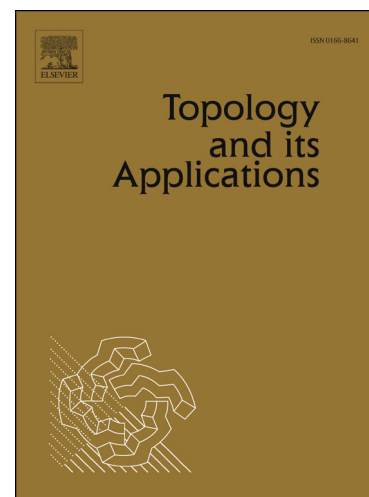
Received date: 22 April 2017

Revised date: 5 July 2018

Accepted date: 5 July 2018

Please cite this article in press as: H.C. Ravelomanana, $PSL_2(\mathbb{C})$ -character varieties and Seifert fibered cosmetic surgeries, *Topol. Appl.* (2018), <https://doi.org/10.1016/j.topol.2018.07.006>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



$PSL_2(\mathbb{C})$ -character varieties and Seifert fibered cosmetic surgeries

Huygens C. Ravelomanana

^aDepartment of Mathematics, University of Georgia, Athens, GA 30602, USA

Abstract

We study small Seifert possibly chiral cosmetic surgeries on not necessarily null-homologous knot in rational homology spheres. We define an absolute semi-norm derived from the Culler-Shalen semi-norm of $PSL_2(\mathbb{C})$ -character variety theory. We prove that two cosmetic slopes must have the same absolute semi-norm and use this result to give a sharp bound on the number of slopes producing the same small Seifert manifold if the ambient manifold satisfies some representation theoretic conditions.

Keywords: Dehn surgeries, cosmetic surgeries, character variety.

2000 MSC: 57M99, 57M25, 57M27, 57M50

1. Introduction

Let Y be a rational homology sphere and K be a knot in Y such that $Y_K := Y \setminus \text{int}(\mathcal{N}(K))$ is *boundary irreducible* and *irreducible*. Two Dehn surgeries $Y_K(r)$ and $Y_K(s)$ with distinct slopes are called *cosmetic* if they are homeomorphic. They are called *truly cosmetic* if the homeomorphism preserve orientation and *chirally cosmetic* if the homeomorphism reverse orientation. The main conjecture about cosmetic surgery is the following [11].

Conjecture 1.1 (Cosmetic surgery conjecture). If two Dehn surgeries $Y_K(r)$ and $Y_K(s)$ with distinct slopes r and s are homeomorphic, then the homeomorphism reverses orientation.

In this paper we will focus on *general* cosmetic surgery and will not distinguish between chiral and truly cosmetic surgeries.

Let's fix a slope s and define

$$C_K(s) = \{\text{slope } r \neq s \mid Y_K(r) \cong Y_K(s)\}.$$

Here we allow the homeomorphism to reverse the orientation. If $C_K(s) \neq \emptyset$ then we have a cosmetic surgery (possibly chiral). The following theorem then gives a bound on the number of element in $C_K(s)$.

Theorem 1.2. Let K be a small knot in Y and $Y_K(s)$ be small-Seifert. If $\text{Hom}(\pi_1(Y), PSL_2(\mathbb{C}))$ contains only diagonalisable representations and $\|s\|$ is not a multiple of $s \cdot \lambda$ then $\#C_K(s) \leq 1$.

Email address: huygens@cirget.ca (Huygens C. Ravelomanana)

Download English Version:

<https://daneshyari.com/en/article/8903938>

Download Persian Version:

<https://daneshyari.com/article/8903938>

[Daneshyari.com](https://daneshyari.com)