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Abstract

Let $\phi : S \rightarrow D$ be a proper holomorphic map from a connected complex surface S onto the open unit disk $D \subset \mathbb{C}$, with $0 \in D$ as its unique singular value, and having fiber genus $g > 0$. Assume that in case $g \geq 2$, $\phi : S \rightarrow D$ admits a deformation $\phi' : S' \rightarrow D$ whose singular fibers are all of simple Lefschetz type. It has been conjectured that the factorization of the monodromy $f \in M_g$ around $\phi^{-1}(0)$ in terms of right-handed Dehn twists induced by the monodromy of $\phi' : S' \rightarrow D$ has the least number of factors among all possible factorizations of f as a product of right-handed Dehn twists in the mapping class group (see [M. Ishizaka, One parameter families of Riemann surfaces and presentations of elements of mapping class group by Dehn twists, J. Math. Soc. Japan

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58 (2) (2006) 585–594]. In this article, the validity of this conjecture is established for $g=1$.

MSC

14D05; 32S30; 14B07; 11F06

Keywords

Elliptic fibration; Singular fiber; Deformation; Monodromy; Modular group; Dehn twist

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