



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS**

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SHORT ABSTRACT

In this work, we present a finite generating set G_2 of \mathcal{H}_2 , the genus-2 Goeritz group of S^3 , in terms of Dehn twists about certain simple closed curves on the standard Heegaard surface. We present an algorithm that describes an element $f \in \mathcal{H}_2$ as a word in the alphabet of G_2 in a certain format. Using a complexity measure defined on reducing spheres, we show that such a description of $f \in \mathcal{H}_2$ is unique.

We also present a finite subset G_3 of \mathcal{H}_3 , the genus-3 Goeritz group of S^3 . We show that the elements in G_3 generates the generating elements of \mathcal{H}_3 proposed by Freedman and Scharlemann. Thus, we verify that G_3 is a generating set of \mathcal{H}_3 .