Abstract

Title: Automorphisms of the fundamental group of a 3-dimensional Sol-manifold

The closed 3-manifolds are divided into 8 families characterized by a geometry on R^3. Then we focus in one of the families called Sol-manifolds, and we explain the topological properties and the construction of this family. In order to describe this family we consider the following two types of groups:
F_0 the family of groups of the form $(\mathbb{Z}+\mathbb{Z})\rtimes_\theta \mathbb{Z}$ where $\theta(1) \in Gl(2,\mathbb{Z})$ is an Anosov matrix, and F_1 the groups which are middle term of certain extension $1 \to H \to G \to \mathbb{Z}_2 \to 1$ where $H \in F_0$ (*). The goal is to present results about $Aut(G)$, as well $Out(G)$, for $G \in F_i$ for $i = 0, 1$. We will explain the relation of these groups with the 3-manifolds, called Sol-Manifolds. As one motivation, the solution of this problem corresponde to the description of the homeomorphism of the manifold up to isotopy. The general approach is to study automorphisms of extensions (short exact sequence) with kernel characteristic. For the groups in F_0 we use the sequence $1 \to \mathbb{Z}+\mathbb{Z} \to G \to \mathbb{Z} \to 1$ and for the groups in F_1 we use the short exact sequence (*) above. The description of the groups will be obtained using several facts, geometric and algebraic, notoriously properties of the group $Gl(2, Z)$. One of the conclusion is that we will obtain a short exact sequence:

$$1 \to \mathbb{Z}+\mathbb{Z} \to Aut(G) \to \mathbb{Z}_2 + (\mathbb{Z} \rtimes \mathbb{Z}_2) \to 1$$

for $G \in F_1$.

This is joint work with Sergio Martins, Federal University of Santa Catarina-Florianopólis-Brazil

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