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On the first homology group of the group of diffeomorphisms of a smooth orbifold and its applications.

Let V be a representation space of a finite group G . Let $\mathcal{D}_G(V)$ denote the group of equivariant diffeomorphisms of V which are G -isotopic to the identity through compactly supported isotopies. In this talk we describe the group structure of $H_1(\mathcal{D}_G(V))$. Then we apply it to the calculation of the first homology of the corresponding automorphism groups of smooth orbifolds, Hausdorff foliations, codimension one or two compact foliations and a locally free S^1 -action on the 3-sphere. The result can be also applied to a smooth manifold M with properly disconnected smooth action.