FLAT MANIFOLDS WITH FINITE ABELIAN HOLONOMY ARISING FROM ARTIN BRAID GROUPS

A surprising result of Auslander and Kuranishi stablished that any finite group G is the linear holonomy group of a flat manifold $\mathcal{X}_G$ with fundamental group a Bieberbach group Γ_G. In this work we show, by using braid theory, the Auslander-Kuranishi theorem for finite abelian groups. Using this approach we obtain an explicit description of the holonomy representation of the Bieberbach group Γ_G. As an application, when the holonomy group is cyclic of odd order, we study the holonomy representation of Γ_G and determine the existence of Anosov diffeomorphisms and Kähler geometry of the flat manifold $\mathcal{X}_G$ with fundamental group the Bieberbach group Γ_G.