

Fatma KHLIF

**Deforming discontinuous subgroups for
threadlike homogeneous spaces**

Abstract. Let G be an exponential solvable Lie group and H a connected Lie subgroup of G . Given any discontinuous subgroup Γ for the homogeneous space $\mathcal{M} = G/H$ and any deformation of Γ , the deformed discrete subgroup may utterly destroy its proper discontinuous action on \mathcal{M} as H is not compact (except the case when it is trivial). To understand this specific issue, we provide an explicit description of the parameter and the deformation spaces of any abelian discrete Γ acting properly discontinuously and fixed point freely on G/H for an arbitrary H of a threadlike nilpotent Lie group G . The topological features of deformations, such as the local rigidity and the stability are also discussed. Whenever the Clifford-Klein form $\Gamma \backslash G/H$ in question is assumed to be compact, these spaces are cutely determined and unlike the case of Heisenberg groups, the deformation space fails in general to be a Hausdorff space. In such a case, this space is shown to admit a smooth manifold as its open dense subset. (This is a joint work with Ali Baklouti).