Deforming quotients of rank-one groups

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Abstract: Consider a Lie group G, such as $SL(2, \mathbb{R})$, as a pseudoriemannian "model" space, with its isometries given by right and left multiplications. A discrete subgroup S of isometries gives rise to a quotient manifold M. We study the deformation theory of M: if the rank of G is one, it turns out that under a cocompactness assumption, all small deformations of the natural embedding $S \to \mathrm{Isom}(G)$ are still embeddings, i.e. M can be "freely" deformed. After providing some general context, I will explain the main tool (Benoist's properness criterion) and the proof, a typical negative-curvature argument. Joint work with Fanny Kassel (Lille).