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Ghys, Étienne (F-ENSLY)
Some examples of deformations of complex manifolds.
Singularities of holomorphic vector fields and related topics (Japanese) (Kyoto, 1993).
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The paper (which is an extract from a longer paper by the author [Invent. Math. **119** (1995), no. 3, 585–614; MR1317651 (95k:58116)]) studies holomorphic dynamical systems corresponding to the action of discrete co-compact subgroups $G \subset \mathrm{SL}(2, \mathbf{C})$ on $\mathrm{SL}(2, \mathbf{C})$. Its purpose is to describe explicit examples of non-trivial deformations of the complex manifolds $\mathrm{SL}(2, \mathbf{C})/G$. The dimension $n = 2$ is special because, due to a result of M. Raghunathan, similar complex manifolds $\mathrm{SL}(n, \mathbf{C})/G$ are rigid as complex manifolds if $n \geq 3$.

We note another possible point of view on such deformations which is linked with the Teichmüller space of a 3-manifold with $\widetilde{\mathrm{PSL}_2\mathbf{R}}$-geometry [see K. Ohshika, Topology Appl. **27** (1987), no. 1, 75–93; MR0910495 (88k:57014)]. Namely, $\widetilde{\mathrm{PSL}_2\mathbf{R}}$ is the universal covering of the group of orientation preserving isometries of the hyperbolic plane $\mathbf{H}^2$, while $\mathrm{SL}(2, \mathbf{C})/G$ is the group of orientation preserving isometries of the hyperbolic space $\mathbf{H}^3$. It is an interesting question whether the space of holomorphic deformations (containing the author's deformations) is non-connected, that is, whether a situation similar to the real case occurs.

Reviewed by *B. N. Apanasov*