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Ranjbar-Motlagh, Alireza (IR-TPM)
The action of groups on hyperbolic spaces. (English summary)
Differential Geom. Appl. **6** (1996), *no. 2,* 169–180.

Let X be a proper geodesic Gromov-hyperbolic metric space, as for instance any complete simply connected Riemannian manifold with sectional curvature $K \leq a < 0$. Let ∂X be its space at infinity. The paper studies the action on $X \cup \partial X$ of a discrete group Γ of isometries of X.

Say Γ is quasiconvex-cocompact if there is a Γ-invariant quasiconvex subset C of X such that $\Gamma \backslash C$ is compact. The limit set $\partial\Gamma$ of Γ is the set of accumulation points in ∂X of any Γ-orbit. After several quite well-known lemmas, the author proves that if Γ_1, Γ_2 are discrete quasiconvex-cocompact groups of isometries of X, so is their intersection $\Gamma_1 \cap \Gamma_2$, and, furthermore, if $\Gamma_1 \cap \Gamma_2$ does not fix a point at infinity, then $\partial(\Gamma_1 \cap \Gamma_2) = \partial\Gamma_1 \cap \partial\Gamma_2$. Then the author essentially proves that if Γ is a discrete group of isometries of X without any element having a unique fixed point at infinity, then Γ either contains a free group on two generators, or is virtually cyclic.

Reviewed by *Frédéric Paulin*