Growth of Kleinian groups : the case of quotients

Jean-Claude PICAUD (Tours - FIM Zürich)

Work (in progress) with
Françoise DAL'BO, Marc PEIGNÉ and Andrea SAMBUSETTI

Summary

Let X be an Hadamard manifold with pinched negative curvature and Γ a non elementary Kleinian group of isometries of X. Any quotient group $\bar{\Gamma} := N\backslash\Gamma$ by a normal subgroup N (possibly trivial) acts by isometries on the quotient space $\bar{X} := N\backslash X$ with respect to the induced distance $\bar{d}$.

We shall be concerned with the comparison between the critical exponents δ_Γ and $\delta_{\bar{\Gamma}}$ of Γ and $\bar{\Gamma}$ respectively, and more precisely for giving a criteria such that the inequality

$$\omega_G(N) := \delta_G - \delta_{\bar{G}} > 0$$

occurs. This inequality for *any* $N \neq \{Id\}$ and for finitely generated groups G with word metrics is a property called *growth tightness* which has been introduced and studied (in this algebraic context) by R. Grigorchuk and P. de la Harpe. The same property was investigated in the riemannian setting of closed negatively curved manifolds by A. Sambusetti, the critical gap $\omega_G(N)$ being estimated in terms of systolic lengths of the manifold. Here, we will consider the case where the Kleinian group Γ is geometrically finite. As will be seen, the growth tightness is no longer true in general due to the presence of parabolic elements, but it remains for a large class of groups. Moreover, we will see how the positivity of $\omega_G(N)$ for each $N \neq \{Id\}$ is related to the *divergence of* $\bar{\Gamma}$.