Tukia, Pekka

Convergence groups and Gromov's metric hyperbolic spaces. (English) Zbl 0855.30036

N. Z. J. Math. 23, No. 2, 157-187 (1994); erratum ibid. 25, No. 1, 105-106 (1996).

The author develops athe notion of convergence group in the context of compact Hausdorff spaces X: "A group G of homeomorphisms of X is a convergence group if, whenever $g_i \in G$ are distinct, there is a subsequence g_{n_i} such that either there is a homeomorphism g of X such that $g_{n_i} \to g$ uniformly on X or there are $a, b \in X$ such that $g_{n_i}|X\setminus\{b\} \to a$ and $g_{n_i}^{-1}|X\setminus\{a\} \to b$ uniformly on compact subsets of $X\setminus\{b\}$ and $X\setminus\{a\}$, respectively."

Such groups have elements which can be classified as elliptic, parabolic, or loxodromic, as in the classical case. Abelian subgroups, non-Abelian free subgroups, fixed points, etc., have many of the classical properties.

The author applies his results to Gromov's hyperbolic metric spaces and their spaces at infinity. By loosening the notion of group slightly, he obtains the notion of approximate groups on a hyperbolic metric space with a conformal or quasiconformal group at infinity.

Reviewer: J.W.Cannon (Provo)

MSC:

30F40 Kleinian groups (aspects of compact Riemann surfaces and uniformization)
20H10 Fuchsian groups and their generalizations (group-theoretic aspects)
57S05 Topological properties of groups of homeomorphisms or diffeomorphisms

Keywords:
Kleinian group; word hyperbolic group; convergence