Hyperbolic Unit Groups

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The notion of hyperbolicity was introduced by Gromov. This is a fast and rapidly growing subject with lots of deep applications. A. Yu. Ol'Shanskii proved that almost every group is hyperbolic. So it becomes an interesting problem of classifying those groups G such that the unit group of ZG, the integral group ring of G, is an hyperbolic group. In this work we pose this problem and classify groups with hyperbolic unit group. This is achieved using the properties of hyperbolic groups and showing the existance of some subgroups that can not be subgroups of an hyperbolic group. In particular if the group G is infinite and the hyperbolic boundary has dimension zero, or equivalently, it is the Cantor set, then the unit group of ZG is trivial.

Another interesting fact is that if G is any group having an element of order 5 and $U(ZG)$ is hyperbolic then G is isomorphic to the cyclic group of order five.

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