
Towards a geometric theory for left loops

Karla Baez

Universidad Autonoma del Estado de Morelos, Mexico

In Group Theory there has been a lot of research on the properties of groups given the geometric and combinatorial properties of their Cayley graphs. More recently, thanks to the works of mathematicians like G. Sabidoussi, G. Gauthier and E. Mwambené, it has been possible to define and study the Cayley graphs of more general structures. These authors gave characterizations of the Cayley graphs of groups, quasigroups and loops respectively. Mwambené has also given a characterization of vertex-transitive graphs as Cayley graphs of left loops with respect to a set with a special characteristic called “quasi-associativity”. The problem is that even with these characterization, certain obvious results for groups are false in general. For example, there are loops such that their Cayley graph with respect to a generating set is not connected. Anyway, in this talk will be shown that, if the set it required to be quasi-associative then the basic theorems of group theory apply also for left loops, allowing to define such concepts as a *hyperbolic left loop* or the *rate of growth of a left loop*.