R-Trees and Normalization of Pseudogroups

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Abstract

Let $\mathcal{G}$ be a pseudogroup defined on a tree Z, and let Γ be a finite set of generators for $\mathcal{G}$. The reduced fundamental group $\bar{\pi}(\Gamma)$ of Γ is defined here. I give a new and experimentally inspired proof of a result of Levitt: If $\bar{\pi}(\Gamma)$ is a free group, there exists a finite set of generators Ψ for $\mathcal{G}$ such that $\bar{\pi}(\Psi)$ is free on the set Ψ. If Ψ has no dead ends, it is an interval exchange.

Like Gaboriau, Levitt and Paulin [Gaboriau et al. 1992], I prove that if G is a finitely presented group acting freely on an $\mathbb{R}$-tree and Γ is a corresponding set of pseudogroup generators, we're in one of the following situations: either G splits as a free product with a noncyclic free abelian summand, or Γ can be reduced to an interval exchange by normalizing and removing a finite number of dead ends, or the process of removing dead ends from Γ does not terminate in a finite number of steps.