

GEOMETRIC AND ASYMPTOTIC GROUP THEORY
WITH APPLICATIONS
2016

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*Genericity of Whitehead minimality for finitely generated subgroups
of free groups*

Monday, June 13, 2016

Stevens Institute of Technology, Kidde 228

11:30 AM

Abstract:

Let F be the free group over a finite alphabet A . Recall that a reduced word w in F is said to be Whitehead minimal if it has minimum length among its automorphic images. The notion is extended to finitely generated subgroups of F : a subgroup H of F is Whitehead minimal if it has minimum size among the elements of its orbit under the action of $\text{Aut}(F)$. Here the size is taken to be the number of vertices in the Stallings graph which is canonically associated with H . This is a direct generalization of the word case, since the size of the cyclic subgroup generated by a cyclically reduced word w is the length of w .

We show that Whitehead minimality is generic for subgroups of F , under two natural distributions: when k is fixed and a subgroup is determined by a random k -tuple of generators of length at most n , and when a subgroup is determined by a random Stallings graph of size n . The proof techniques are quite different in the two distributions, as it is indeed for different reasons that Whitehead minimality is generic in both cases.

This is joint work with F. Bassino and C. Nicaud.