The intersection problem in $Z^m \times F_n$

Enric Ventura

Departament de Matemàtiques, Escola Politècnica Superior d'Enginyeria de Manresa

Universitat Politècnica de Catalunya

Av. Bases de Manresa 61-73 08242 - Manresa Barcelona, Spain

enric.ventura@upc.edu

It is well-known that free groups are Howson and how can we compute a free-basis of the $H \cap K$, given finite free-bases for H and K; this can be done with a nice and fast method using Stallings automata. We study the same question in the groups $G = Z^m \times F_n$, looking somehow similar but behaving very differently: they are not Howson, i.e., intersections of finitely generated subgroups may very well be not finitely generated. We provide an algorithm which, given finite "bases" (in an appropriate sense) of H and K, it decides whether $H \cap K$ is finitely generated or not and, in case it is, computes a finite basis for $H \cap K$. The techniques used are similar as for the free group, namely Stallings automata, but decorated appropriately with vectors attached to the edges.

This is a joint work with Jordi Delgado.