

Conciseness and strong conciseness in profinite groups

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Abstract. A group word w is said to be concise in a class \mathcal{C} of groups if, for each G in \mathcal{C} such that G_w is finite, also $w(G)$ is finite. For topological groups, especially profinite groups, a variation of the classical notion arises quite naturally: we say that w is strongly concise in a class \mathcal{C} of topological groups if, for each G in \mathcal{C} , already the bound $|G_w| < 2^{\aleph_0}$ implies that $w(G)$ is finite.

In this talk we discuss conciseness of some words in the class of all residually finite groups and strong conciseness in the class of all profinite groups. We will show that multilinear commutator words are strongly concise in the class of all profinite groups and that every group word is strongly concise in the class of nilpotent profinite groups. From this we can deduce, for instance, that, if w is one of the group words x^2 , x^3 , x^6 , $[x^3, y]$ or $[x, y, y]$, then w is strongly concise in the class of all profinite groups.