The R_∞–property for nilpotent quotients of free groups and surface groups

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Let $\varphi : G \to G$ be an endomorphism of a group G. We say that two elements $x, y \in G$ are Reidemeister equivalent (or are in the same twisted conjugacy class) if there exists a third element $z \in G$ such that $x = zy\varphi(z)^{-1}$. The Reidemeister number $R(\varphi)$ of φ is the number of equivalence classes (or twisted conjugacy classes) for this equivalence relation. This number is either a positive integer or infinite.

I will start my talk by recalling that for a space X (admitting covering space theory), it is known that the number of fixed point classes of a self map $f : X \to X$ is exactly the Reidemeister number $R(f_*)$ where $f_* : \pi(X) \to \pi(X)$ is induced by f.

Recently, there has been a growing interest in those groups G for which $R(\varphi) = \infty$ for all $\varphi \in \mathrm{Aut}(G)$. Such a group is said to have the R_∞–property.

It is known that "most" finitely generated groups do have the R_∞–property. On the other hand nilpotent groups, certainly when they are of small nilpotency class, do have much more change not to have this property.

Therefore, we propose to study the following question: Given a group G which has the R_∞–property. Determine the largest positive integer c such that $G/\gamma_{c+1}(G)$ does not have the R_∞–property.

We will answer this question for free groups of finite rank and for fundamental groups of closed surfaces.