Zentralblatt–MATH

Goryaga, A.V.
Example of a finite extension of an FAC-group not being an FAC-group. (Russian)
Sib. Mat. Zh. 27, No.3(157), 203-205 (1986).

The group G is called conjugacy separable (FAC-group in the author's terminology) if any two elements of G are conjugate in G if and only if their images are conjugate in every finite quotient of G. The author shows that the class of conjugacy separable groups is not closed under finite extensions. More precisely, let

$$G = (F_k * (F_n \times F_m)) \leftthreetimes (\mathbf{Z}_2[F_n \times F_m])$$

be a semidirect product, where F_i is a free group of rank i, F_k acts trivially and $F_n \times F_m$ acts by left multiplications. Let H be a subgroup of $F_n \times F_m$ with generators $h_1, ..., h_k$, for which there is no algorithm whereby one can decide whether any element belongs to H. Let ϕ be an automorphism of G of order 2, which acts trivially on $F_n \times F_m$ and $\phi(z_j) = (z_j, 1 - h_j)$ for free generators z_j of F_k. Let $G^* =< \phi > \leftthreetimes G$ be a semidirect product. Then G is conjugacy separable, but G^* is not.

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