ACTION OF A FROBENIUS-LIKE GROUP

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Let F be a finite group acted on by a finite group H via automorphisms. This action is said to be Frobenius if every nonidentity element $h \in H$ acts fixed-point-freely. Accordingly the semidirect product FH is called a Frobenius group with kernel F and complement H whenever F and H are nontrivial. It is well known that Frobenius actions are coprime actions and the kernel F is nilpotent.

We introduce a slight generalization of the Frobenius group, more precisely, we consider nontrivial finite groups F and H so that H acts on F via automorphisms, F is nilpotent and $[F, h] = F$ for all nonidentity elements $h \in H$, and call the semidirect product FH a "Frobenius-like group". (Here, $[F, h] = \langle [f, h] : f \in F] \rangle$) It should be noted that the group FH is Frobenius-like if and only if F is a nontrivial nilpotent group and the group FH/F' is Frobenius with kernel F/F' and complement isomorphic to H.

Every non-nilpotent finite group contains nilpotent subgroups that are normalized but not centralized by elements of coprime order. Therefore there are sections of the form $1 \neq [N, g]\langle g \rangle$, where N is a nilpotent p'-subgroup and g has prime order p. Such a section is a special case of a Frobenius-like group and this observation brings us to say that "there is an abundance of Frobenius-like groups around".

There have been a lot of research about the structure of finite solvable groups admitting a Frobenius group FH of automorphisms. In this talk the action of a Frobenius-like group FH on a finite group G will be discussed and some recent results by Ercan, Güloğlu and Khukhro will be presented.

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