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ON A CONJECTURE OF A BOUND FOR THE EXPONENT OF THE SCHUR MULTIPLIER OF A FINITE p-GROUP

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ABSTRACT. Let G be a p-group of nilpotency class k with finite exponent $\exp(G)$ and let $m = \lfloor \log_p k \rfloor$. We show that $\exp(M^{(c)}(G))$ divides $\exp(G)p^{m(k-1)}$, for all $c \geq 1$, where $M^{(c)}(G)$ denotes the c-nilpotent multiplier of G. This implies that $\exp(M(G))$ divides $\exp(G)$ for all finite p-groups of class at most $p-1$. Moreover, we show that our result is an improvement of some previous bounds for the exponent of $M^{(c)}(G)$ given by M. R. Jones, G. Ellis and P. Moravec in some cases.

1. Introduction and Motivation

Let a group G be presented as a quotient of a free group F by a normal subgroup R. Then the c-nilpotent multiplier of G (the Baer invariant of G with respect to the variety of nilpotent group of class at most c) is defined to be

$$M^{(c)}(G) = \frac{R \cap \gamma_{c+1}(F)}{[R,\ {}_cF]},$$

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