Length of Finite Groups

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Let p be a prime. Every finite group G has a normal series each of whose quotients either is p-soluble or is a direct product of nonabelian simple groups of orders divisible by p. The non-p-soluble length $\lambda_p(G)$ is defined as the number of non-p-soluble quotients in a shortest series of this kind. We deal with the question whether, for a given prime p and a given proper group variety $\mathfrak{V}$, the non-p-soluble length $\lambda_p(G)$ of a finite group G whose Sylow p-subgroups belong to $\mathfrak{V}$ is bounded. In joint work with Pavel Shumyatsky, we answer the question in the affirmative in some cases (working separately the case $p = 2$) for varieties of groups in which the commutators have conditions that depends on exponent conditions and Engel conditions.

References

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