Lie derived length of group algebras of characteristic 2*

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Abstract

Let G be a group and F a field of characteristic p. The group algebra FG can be considered as a Lie algebra with the Lie operation defined by $[x,y] = xy - yx$. Let $\delta^{[0]}(FG) = FG$, and let $\delta^{[n+1]}(FG)$ denote the additive subgroup of FG generated by all $[x,y]$ with $x, y \in \delta^{[n]}(FG)$. We say that FG is Lie solvable if $\delta^{[n]}(FG) = 0$ for any integer n, and the smallest such n is called the Lie derived length of FG. Passi, Passman and Sehgal [1] proved that FG is Lie solvable if and only if either $p = 0$ and G is abelian, or $p > 2$ and G' is a finite p-group, or $p = 2$ and G contains a subgroup of index at most 2 whose derived subgroup is a finite 2-group. However, we still know very little about the Lie derived length of group algebras, especially when $p = 2$. In [2] we gave the Lie derived length of FG in the case when p is an odd prime, and G' is a cyclic p-group. In this presentation we are going to investigate the case $p = 2$. Meanwhile we will point out some possibilities of using computer algebra systems for observing Lie properties of group algebras.

Keywords: Group algebra, Lie derived length

MSC: 16S34, 17B30

References

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