BULLETIN OF THE
AMERICAN MATHEMATICAL SOCIETY
Volume 78, Number 1, January 1972

SCHUR MULTIPLIERS OF THE KNOWN FINITE SIMPLE GROUPS[1]

BY ROBERT L. GRIESS, JR.

Communicated by M. Suzuki, July 12, 1971

ABSTRACT. In this note, we announce some results about the Schur multipliers of the known finite simple groups. Proofs will appear elsewhere. We shall conclude with a summary of current knowledge on the subject.

Basic properties of multipliers and covering groups of finite groups are discussed in [**6**]. Notation for groups of Lie type is standard [**3**], [**8**]. G' denotes the commutator subgroup of the group G, $Z(G)$ the center of G, Z_n the cyclic group of order n; other group theoretic notation is standard (see [**5**] or [**6**]). $M_p(G)$ denotes the p-primary component of the multiplier $M(G)$ of the finite group G. $m(G)$ is the order of $M(G)$ and $m_p(G)$ is that of $M_p(G)$. Also, q denotes a power of the prime p.

We describe these results in a sequence of theorems.

THEOREM 1. $m_2(G_2(4)) = 2$, $m_3(G_2(3)) = 3$, $m_2(F_4(2)) = 2$.

In each of these cases, generators and relations for the (unique) covering group are given.

THEOREM 2. $M(^2A_2(q)) \cong Z(SU(3, q))$, *i.e.* $m(SU(3, q)) = 1$.

THEOREM 3. *Let G be a Steinberg variation defined over a finite field of characteristic p, i.e.* $G = {}^2A_n(q)$, $n \geqq 2$, ${}^2D_n(q)$, $n \geqq 4$, ${}^3D_4(q)$, *or* ${}^2E_6(q)$. *Then* $M_p(G) = 1$ *except for*

$$M_2(^2A_3(2)) \cong Z_2, \qquad M_3(^2A_3(3)) \cong Z_3 \times Z_3,$$

$$M_2(^2A_5(2)) \cong Z_2 \times Z_2, \qquad M_2(^2E_6(2)) \cong Z_2 \times Z_2.$$

THEOREM 4. *If G is a Ree group of type F_4, then* $m(G) = 1$.

THEOREM 5. *The Tits simple group ${}^2F_4(2)'$ has trivial multiplier.*

THEOREM 6. *The sporadic groups below have multipliers of the stated orders.*

AMS 1970 *subject classifications*. Primary 20C25, 20D05, 20G40; Secondary 20G05, 20F25.

Key words and phrases. Schur multiplier, covering group, finite group of Lie type, sporadic group, simple group.

[1] This research is from the author's Ph.D. Thesis, University of Chicago, 1971, written under the supervision of Professor John G. Thompson and with the financial support of an N. S. F. Graduate Fellowship.