

## THIN FINITE SIMPLE GROUPS

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Let  $G$  be a finite group. Define  $e(G)$  to be the maximum of the  $p$ -ranks  $m_p(M)$  as  $M$  ranges over 2-local subgroups of  $G$  and  $p$  ranges over all odd primes.  $G$  is *thin* if  $e(G) = 1$ . The following classification is obtained:

**THEOREM.** *Let  $G$  be a thin finite simple group. Then  $G$  is isomorphic to  $L_2(q)$ ,  $L_3(p)$ ,  $p = 1 + 2^a 3^b$ ,  $U_3(p)$ ,  $p = -1 + 2^a 3^b$ ,  $b = 0$  or  $1$ ,  $p$  an odd prime,  $Sz(2^n)$ ,  $U_3(2^n)$ ,  $L_3(4)$ ,  ${}^3D_4(2)$ ,  ${}^2F_4(2)'$ ,  $M_{11}$ , or  $J_1$ .*

$G$  is of *characteristic 2 type* if  $F^*(M)$  is a 2-group for each 2-local subgroup  $M$  of  $G$ . It appears that in the near future the problem of classifying the finite simple groups will be reduced to the determination of groups of characteristic 2 type. Those familiar with the  $N$ -group paper will recognize that the characteristic 2 type classification can be naturally subdivided into the cases  $e(G) = 1$ ,  $e(G) = 2$ , and  $e(G) \geq 3$ . Hence the thin group classification may be regarded as one step in the program to classify the finite simple groups.

The proof is quite lengthy and will appear elsewhere.

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