ON ORDERS OF ELEMENTS OF FINITE
ALMOST SIMPLE GROUPS

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We will discuss the problem of calculating the orders of elements in the coset αS, where S is a nonabelian simple group of Lie type and α is an outer automorphism of S. This work was inspired by the recent progress in solving the recognition-by-spectrum problem: it was proved that any finite group G that has the same orders of elements as a nonabelian simple group S of Lie type of sufficiently large Lie rank is very close to S, namely, $S \leq G \leq \operatorname{Aut} S$. On the other hand, it is clear that not all groups G with $S < G \leq \operatorname{Aut} S$ have the same orders of elements as S, and one of our goals is to determine those G that have.

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