

## ACYCLIC 2-DIMENSIONAL COMPLEXES AND QUILLEN'S CONJECTURE

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**Abstract:** Let  $G$  be a finite group and  $\mathcal{A}_p(G)$  be the poset of nontrivial elementary abelian  $p$ -subgroups of  $G$ . Quillen conjectured that  $O_p(G)$  is nontrivial if  $\mathcal{A}_p(G)$  is contractible. We prove that  $O_p(G) \neq 1$  for any group  $G$  admitting a  $G$ -invariant acyclic  $p$ -subgroup complex of dimension 2. In particular, it follows that Quillen's conjecture holds for groups of  $p$ -rank 3. We also apply this result to establish Quillen's conjecture for some particular groups not considered in the seminal work of Aschbacher–Smith.

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**Key words:** Quillen's conjecture, poset,  $p$ -subgroups.