

# TOPOLOGICAL METHODS TO SOLVE EQUATIONS OVER GROUPS

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We present a large class of groups (no group known to be not in the class) that satisfy the Kervaire-Laudenbach Conjecture about solvability of non-singular equations over groups. We also show that certain singular equations with coefficients over groups in this class are always solvable. Our method is inspired by seminal work of Gerstenhaber-Rothaus, which was the key to prove the Kervaire-Laudenbach Conjecture for residually finite groups. Exploring the structure of the  $p$ -local homotopy type of the projective unitary group, we manage to show that many singular equations with coefficients in unitary groups can be solved in the unitary group.

*Joint work with Anton Klyachko.*