On the computations of some homological functors of 2-engel groups of order at most 16

Abstract

The homological functors including $J(G)$, $\nabla(G)$, exterior square, the Schur multiplier, $(G)\Delta$, the symmetric square and $J(G)$ of a group were originated in homotopy theory. The nonabelian tensor square which is a special case of the nonabelian tensor product is vital in the computations of the homological functors of a group. It was introduced by Brown and Loday in 1987. The nonabelian tensor square G?G of a group G is generated by the symbols g ? h, for all g,h?G subject to the relations gg'?h=(gg'?gh)(g?h) and g?hh'=(g?h)(hg?hh'), for all g,g',h,h' ?G where g g' = gg'g-1 . In this paper, the computations of nonabelian tensor squares and some homological functors of all 2-Engel groups of order at most 16 are done. Groups, Algorithms and Programming (GAP) software has been used to assist and verify the results.