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The computation of Stiefel–Whitney classes

Research in finite group cohomology has acquired a new flavour in recent years, thanks to the availability of numerous explicit calculations by Jon Carlon and David Green, using computers. Concrete examples have been produced en masse.

If you look at these computations and compare them with the sort of results which would be presented by a mathematician, a major difference is that most of us would try to present the *Stiefel–Whitney classes* in the cohomology ring. These classes are associated with real representations of the group, and have thus a geometric meaning. Moreover, it is more satisfying to explain an algebraic relation in the cohomology ring in terms of a representation-theoretic fact (for example involving tensor products or exterior powers).

Another piece of information which one would like to add to the computer calculation is the effect of *Steenrod operations* on the ring. These give a much richer structure.

At first sight it seems difficult to use any of the available definitions in order to teach a computer to deal with this. In this talk I will explain, however, how one can use a simple trick to perform the calculations in most cases. You can see the results on my webpage: `http://www-irma.u-strasbg.fr/~guillot/research/cohomology_of_groups/index.html`