<<Steenrod Squares in >>

<<Steenrod Squares in Spectral Sequences   >>

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This book develops a general theory of Steenrod operations in spectral sequences. It gives special attention to the change-of-rings spectral sequence for the cohomology of an extension of Hopf algebras and to the Eilenberg-Moore spectral sequence for the cohomology of classifying spaces and homotopy orbit spaces. In treating the change-of-rings spectral sequence, the book develops from scratch the necessary properties of extensions of Hopf algebras and constructs the spectral sequence in a form particularly suited to the introduction of Steenrod squares. The resulting theory can be used effectively for the computation of the cohomology rings of groups and Hopf algebras, and of the Steenrod algebra in particular, and so should play a useful role in stable homotopy theory. Similarly the book offers a self-contained construction of the Eilenberg-Moore spectral sequence, in a form suitable for the introduction of Steenrod operations. The corresponding theory is an effective tool for the computation of the cohomology rings of the classifying spaces of the exceptional Lie groups, and it promises to be equally useful for the computation of the cohomology rings of homotopy orbit spaces and of the classifying spaces of loop groups.

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