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William C Kronholm* (wkronhol@uoregon.edu), 1939 Agate Alley #2, Eugene, OR 97403.

RO(G)-Graded Serre Spectral Sequence.

The main result of this paper is to extend the spectral sequence of a G -fibration to the $RO(G)$ -graded theory, with particular attention to the case $G = \mathbb{Z}/2$. Applications include progress towards equivariant characteristic classes and computations of the $RO(G)$ -graded cohomology ring of certain loop spaces and projective bundles associated to equivariant vector bundles. (Received September 17, 2007)