

Abstract

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An explicit construction of the Chern character

We examine a construction of an operator-theoretic model of the universal fibration $EGL(\infty) \rightarrow BGL(\infty)$, proposed by Daniel Freed. Fixing a generic separable Hilbert space \mathcal{H} , the thereby constructed Banach-Lie group $Freed(\mathcal{H}) \simeq BGL(\infty)$ allows us to write down explicit Chern-Weil type formulae for invariant representatives of the primitive generators ch_i , making use of a special 2-form Ω . Under suitable conditions, these forms then pull back via the classifying maps of virtual bundles to invariant forms on general Banach-Lie groups G . The aim of this thesis is twofold. We try to expand these considerations to a more general setting by using Alexander-Spanier cocycles instead of differential forms. Furthermore, we implement a variant of this construction in a situation with group actions, by substituting \mathcal{H} with an appropriate space that admits a Γ -action. In the end, we hope for a formula for the equivariant Chern character as a map from equivariant K -theory into the delocalized equivariant cohomology that was defined by Baum, Brylinski and MacPherson.