
MR597668 (82j:57029)

Hurder, Steven

On the homotopy and cohomology of the classifying space of Riemannian foliations.

Proc. Amer. Math. Soc. **81** (1981), *no. 3*, 485–489.
57R32 (55Q35 55R60 57R20)

Let $BR\Gamma^q$ be the Haefliger classifying space for Riemannian foliations, $B\mathrm{O}(q)$ the classifying space for $\mathrm{O}(q)$-bundles and $FR\Gamma^q$ the homotopy-theoretic fiber of the classifying map $\nu\colon BR\Gamma^q \to B\mathrm{O}(q)$.

The author shows the $(q-1)$-connectivity of $FR\Gamma^q$, and, more generally in the classifying theory of G-foliated microbundles for G a closed subgroup of $\mathrm{GL}(q,\mathbf{R})$, of the corresponding $F\tilde{\Gamma}^q_G$. For $F\Gamma^q_{\mathrm{Sl}}$, this is a result of Haefliger. For $FR\Gamma^{4k+3}$, this is the best possible result, according to a vanishing theorem of Pasternack.

It has applications to the existence of nontrivial Whitehead products in the homotopy of $BR\Gamma^q$ and to the nonnullity of the image of some secondary characteristic classes in $H^*(FR\Gamma^q,\mathbf{R})$.

The method consists in an explicit construction of an integrable homotopy out of a homotopy of G-foliations with trivial G-structures in order to apply the Gromov-Phillips-Haefliger theorem.

Reviewed by *Claude Lamoureux*