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ON EXOTIC CHARACTERISTIC CLASSES OF CONFORMAL AND PROJECTIVE FOLIATIONS

KENJI YAMATO*)

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Introduction

R. Bott [1] and A. Haefliger [3] defined exotic characteristic classes of foliations. In this paper, we shall study exotic characteristic classes of locally homogeneous conformal and projective foliations with trivialized normal bundles. Our purpose is to decide whether these exotic characteristic classes vanish always or not in general.

Let Γ be a pseudogroup acting *transitively* on a smooth manifold B of dimension n. A *locally homogeneous* Γ*-foliation* of condimension n on a manifold M is by definition a maximal family $\mathfrak{F}$ of submersions $f_\alpha\colon U_\alpha \to B$ of open sets U_α in M such that the family $\{U_\alpha\}$ is an open covering and for each $x \in U_\alpha \cap U_\beta$ there exists and element $\gamma^x_{\alpha\beta} \in \Gamma$ with $f_\beta = \gamma^x_{\alpha\beta} \cdot f_\alpha$ in some neighbourhood of x. If the above Γ is consisting of locally conformal (resp. projective) transformations on B, $\mathfrak{F}$ is called *locally homogeneous conformal* (resp. *projective*) *foliation.*

Let $\mathfrak{F}$ be a foliation of codimension n on M with trivialized normal bundle and t the trivialization. Exotic characteristic classes of $(\mathfrak{F}, t)$ are defined as the images of the mapping

$$\lambda^*_{(\mathfrak{F},t)}\colon H^*(W_n) \to H^*_{DR}(M)$$

which depends only on $\mathfrak{F}$ and t ([1], [3]). The Vey-basis $\{Z_{(I,J)}\}$ of $H^*(W_n)$ is consisting of the following cohomology classes [4]

$$Z_{(I,J)} = [h_{j_0} \wedge h_{j_1} \wedge \cdots \wedge h_{j_k} \otimes (c_1)^{i_1} \cdots (c_n)^{i_n}]\,,$$

where $I=(i_1, \cdots, i_n)$ and $J=(j_0, \cdots, j_k)$ with

$$1 \leqq j_0 < j_1 < \cdots < j_k \leqq n,\ k \geqq 0,\ j_0 + \sum_{r=1}^{n} r i_r \geqq n+1,\ \sum_{r=1}^{n} r i_r \leqq n\,,$$

and $i_r = 0$ for $r < j_0$.

We devide these elements of Vey-basis into following three types;

(I) $\quad j_0 + \sum_r r i_r > n+1$ (*i.e.* rigid classes [4])

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