MOD 3 PONTRYAGIN CLASS AND INDECOMPOSABILITY OF DIFFERENTIABLE MANIFOLDS.

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Introduction. We have already dealt with the indecomposability of differentiable manifolds twice ([1], [2]). In this paper we shall show an application of the mod q Pontryagin class, where q denotes a prime number bigger than 2, on this problem. The mod q Pontryagin classes were systematically investigated by Hirzebruch ([3], [4]). In particular the vanishment of mod 3 dual-Pontryagin class of the highest dimension is fundamental for our purpose.

1. Let q be a prime number bigger than 2 and let X_n be a compact orientable differentiable n-manifold. For any cohomology class $v \in H^{n-2r(q-1)}(X_n, Z_q)$ it holds that

$$\mathfrak{P}_q^r v = s_q^r v \ ([3], [4]), \tag{1. 1}$$

where $\mathfrak{P}_q^r$ denotes the Steenrod power ([7])

$$\mathfrak{P}_q^r : H^t(X_n, Z_q) \longrightarrow H^{t+2r(q-1)}(X_n, Z_q) \tag{1. 2}$$

and s_q^r denotes a mod q polynomial of Pontryagin classes such that

$$s_q^r = q^r L_{\frac{1}{2}r(q-1)}(p_1, \cdots, p_t) \quad \text{mod } q\,, \quad t = \frac{1}{2}r(q-1) \tag{1. 3}$$

where

$$\prod_i \left(\sqrt{\gamma_i}/tgh\sqrt{\gamma_i}\right) = \sum_{j\geqq 0} L_j(p_1, \cdots, p_j)\,, \tag{1. 4}$$

$$p = \sum_{i\geqq 0} p_i = \prod_i (1+\gamma_i) \quad \text{and} \tag{1. 5}$$

$$p_i \in H^{4i}(X_n, Z)\,. \tag{1. 6}$$

The dimension of s_q^r is equal to $2r(q-1)$. We put

$$\sum_{i\geqq 0} b_{q,i} = \prod_i (1+\gamma_i^l)\,, \quad b_{q,j}^* \in H^{4j}(X_n, Z_q) \tag{1. 7}$$