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Corrigendum to "On differential Characteristic Classes"

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**CORRIGENDUM TO "ON DIFFERENTIAL
CHARACTERISTIC CLASSES" J. AUST. MATH. SOC.,
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(January 20, 2016)

Abstract

In this erratum we correct a mistake in "On differential characteristic classes" by the author.

1. Corrigendum

A typo in line -3 of [2, p.34]. $\Omega_{\mathbb{Z}}^{2k-1}(M)$ must be replaced by $\Omega_A^{2k-1}(M)$.

A mistake in [2, Proposition 3.1]: it does not hold in the stated generality.¹ In fact, [2, Proposition 3.1] only holds for Lie groups G with finitely many components with the additional assumption that $H^{\text{even}}(BG)$ is torsion free. In particular, [2, Proposition 3.1] holds for $GL(n; \mathbb{C})$ and $U(n)$; i.e., for differential characteristic classes for complex (Hermitian) vector bundles, while it does not hold for $O(n)$, etc. The differential Steifel–Whitney classes [3] is a counterexample.

Of course [2, Proposition 3.1] would hold in the stated generality if the condition $\delta_2(S_{P,u}(E, \theta)) = u$ is added, as guaranteed by [1, Theorem 2.2]. But the point of the proof of [2, Proposition 3.1] is to avoid using universal bundles and universal connections. The proof of the general case and the analog of [2, Proposition 3.1] for some other Lie groups will be addressed in a future paper.

References

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¹We would like to thank Thomas Schick for bringing up this point.

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