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Corrections to "Topology of the moduli space of $SU(2)$-instantons with instanton number 2" [*This Journal Vol.* **34 (1987), 741-761**]

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Theorem 4 contained an error. Consequently Proposition 5 should also be corrected. The correct statements should read as follows.

THEOREM 4. *The Stiefel-Whitney class and the Pontrjagin class of the $SO(3)$-bundle $p: \tilde{\mathcal{M}}_2 \to \mathcal{M}_2$ are given by*

$$w_2 = \bar{x} \quad \textit{and} \quad p_1 = 3z.$$

PROPOSITION 5. *The cohomology groups of $\tilde{\mathcal{M}}_2$ are given by the following table.*

q	0	1	2	3	4	5	6	7	8	9
$H^q(\tilde{\mathcal{M}}_2; Z)$	Z	0	Z_2	Z_2	Z_{12}	Z_2	Z_2	$Z \oplus Z_2$	0	Z_2

The error in Theorem 4 stemed from erroneous computations in §6. On line 2 in p. 759 it was stated that

$$\bar{\Delta}^*(w_2(\xi)) = \bar{\Delta}^*(w_2(\tilde{\xi}/\tau)) = \alpha^2.$$

But the correct statement is

$$\bar{\Delta}^*(w_2(\xi)) = \bar{\Delta}^*(w_2(\tilde{\xi}/\tau)) = 0.$$

Consequently the following alterations should be made.

LEMMA (6.2). *$\bar{\Delta}^*(\bar{x}) = 0$ and $\bar{\Delta}^*(\alpha^2) = \alpha^2$ in $H^2(RP^2; Z_2)$.*
Also, both in (6.1) *and on line* 7 *from the bottom in p.* 759,

$$w_2(P/\tau) = \bar{x}.$$

As to Proposition 5 its proof which was given starting from line 3 from the bottom in p. 759 should be replaced by the following one.

We consider the Serre spectral sequence of the $SO(3)$-bundle $\tilde{\mathcal{M}}_2 \to$

$\mathcal{M}_2$ with $\boldsymbol{Z}_2$ and $\boldsymbol{Z}$ coefficients simultaneously using Theorem 4 and find that the cohomology groups of $\tilde{\mathcal{M}}_2$ are given additively as in Proposition 5. Moreover we see that the generator β of $H^2(\tilde{\mathcal{M}}_2; \boldsymbol{Z}) \cong \boldsymbol{Z}_2$ comes from $\mathcal{M}_2$ via p^* (cf. Proposition 4) and $\beta^2 = 2\delta$ where δ is a generator of $\boldsymbol{Z}_4$-part of $H^2(\tilde{\mathcal{M}}_2; \boldsymbol{Z}) \cong \boldsymbol{Z}_3 \oplus \boldsymbol{Z}_4$. Furthermore if γ denotes the generator of $H^3(\tilde{\mathcal{M}}_2; \boldsymbol{Z}) \cong \boldsymbol{Z}_2$ then $\beta\gamma$ generates $H^5(\tilde{\mathcal{M}}_2; \boldsymbol{Z}) \cong \boldsymbol{Z}_2$.

Next, by using the Serre spectral sequences of $\tilde{\mathcal{M}}_2^\vee \to \mathcal{M}_2^\vee$ with coefficients in $\boldsymbol{Z}_2$ and $\boldsymbol{Z}$ simultaneously we obtain Lemma (6.4) as was correctly stated in p. 760 which gave the ring structure of $H^*(\tilde{\mathcal{M}}_2^\vee; \boldsymbol{Z})$.

At the last stage we use the Gysin sequence with $\boldsymbol{Z}_2$-coefficient of the double covering $\tilde{\mathcal{M}}_2^\vee \to \tilde{\mathcal{M}}_2$ to determine the ring structure of $H^*(\tilde{\mathcal{M}}_2; \boldsymbol{Z})$. The result is given in the following table.

q	0	1	2	3	4	5	6	7	8	9
$H^q(\tilde{\mathcal{M}}_2; \boldsymbol{Z})$	$\boldsymbol{Z}$	0	$\boldsymbol{Z}_2$	$\boldsymbol{Z}_2$	$\boldsymbol{Z}_3 \oplus \boldsymbol{Z}_4$	$\boldsymbol{Z}_2$	$\boldsymbol{Z}_2$	$\boldsymbol{Z} \oplus \boldsymbol{Z}_2$	0	$\boldsymbol{Z}_2$
generators	1		β	γ	$p^*(z), \delta$	$\beta\gamma$	$\beta\delta$	$\tilde{\pi}!(v), \gamma\delta$		$\beta\gamma\delta$

We know that $\delta^2 = 0$ but we do not know whether $\gamma^2 = 0$ or not.

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