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CORRECTION TO: "COHOMOLOGY OF A HOPF ALGEBRA OVER Z_2"

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M. Tezuka [2] pointed out that there are some errors in calculations in [1]. The following is the correction of our calculations.

Denote $a_0(a_1c_0^2+c_1a_0^2)$ by s_1 and $(b_1c_0^2+c_1b_0^2)b_0$ by s_2. Then we have the following

LEMMA 5.1.1.

(1) $ds_1=a_1^2a_0b_0^2, \qquad ds_2=b_1^2a_0^2b_0.$

(2) $d(c_1a_0c_0^2)=b_1s_1+a_1c_1a_0b_0^2, \qquad d(c_1c_0^2b_0)=a_1s_2+b_1c_1a_0^2b_0.$

Proof. (1) $ds_1=a_0(a_1\cdot dc_0^2+dc_1\cdot a_0^2)=a_1^2a_0b_0^2$. ds_2 can be obtained similarly.

(2) As $d(c_1c_0^2)=c_1\cdot dc_0^2+dc_1\cdot c_0^2=c_1(a_1b_0^2+b_1a_0^2)+a_1b_1c_0^2=b_1(a_1c_0^2+c_1a_0^2)+a_1c_1b_0^2$, we can get $d(c_1a_0c_0^2)=a_0\cdot d(c_1c_0^2)=b_1a_0(a_1c_0^2+c_1a_0^2)+a_1c_1a_0b_0^2=b_1s_1+a_1c_1a_0b_0^2$. Another equation can be obtained similarly. q.e.d.

In the spectral sequence $\{E_r(\Lambda), d_r\}$, this lemma shows that $d_2s_1=d_2s_2=0$, which mean that s_1 and s_2 survives in E_3, and that $d_2(c_1a_0c_0^2)=b_1s_1$ and $d_2(c_1c_0^2b_0)=a_1s_2$ which mean that there are relations b_1s_1 and a_1s_2 in E_3

Thus we get

$$E_3\cong \boldsymbol{Z}_2[a_0, a_1, b_0, b_1]\otimes\boldsymbol{Z}_2[c_1^2, c_0^4, s_1, s_2]/R$$

where R is an ideal generated by the following relations:

$$a_0b_0,\ a_1b_1,\ a_1b_0^2+a_0^2b_1,\ b_1s_1,\ a_1s_2,\ b_0s_1,\ a_0s_2,\ s_1s_2$$

$$s_1^2+a_0^2a_1^2c_0^4+a_0^6c_1^2,\ s_2^2+b_0^2b_1^2c_0^4+b_0^6c_1^2.$$

The above lemma also shows that $s_1+a_1^2c_0b_0$ and $s_2+a_0c_0b_1^2$ are permanent cycles.

Subsequently the main result in [1] is restated as follows:

THEOREM 5.2. *As an algebra over* $\boldsymbol{Z}_2$

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$$Cotor^A(\boldsymbol{Z}_2, \boldsymbol{Z}_2) \cong \boldsymbol{Z}_2[u_1, u_2, v_1, v_2, w_1, w_2, z_1, z_2]/R$$

where $u_1=\{a_0\}$, $u_2=\{a_1\}$, $v_1=\{b_0\}$, $v_2=\{b_1\}$, $w_1=\{c_0^4+c_1 d\alpha^2\}$, $w_2=\{c_1^2\}$, $z_1=\{a_0(a_1c_0^2+c_1a_0^2)+a_1^2c_0b_0\}$, *and* $z_2=\{(b_1c_0^2+c_1b_0^2)b_0+a_0c_0b_1^2\}$ *denote the respective cohomology classes of their representative cocycles, and* R *denotes the ideal generated by*

$$u_1v_1,\ u_2v_2,\ u_1^2v_2+u_2v_1^2,\ v_2z_1,\ u_2z_2,\ v_1z_1,\ u_1z_2,\ z_1z_2,$$

$$z_1^2+u_1^2u_2^2w_1+u_1^6w_2,\ z_2^2+v_1^2v_2^2w_1+v_1^6w_2.$$

REFERENCES

[1] Y. ANDO, Cohomology of a Hopf algebra over $\boldsymbol{Z}_2$, Kodai Math. J., 12 (1989), 332-338.

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