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Erratum to "Topology of Hopf surfaces"

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By Masahide KATO

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The author was kindly informed by M. Ue that the statement of Theorem 9 was incomplete and a certain subcase was missing. As was pointed out by Ue, this error had its origin in Lemma 4 of the paper which claimed that $N_{SL(2,C)}(B_n)=B_{2n}$ for $n\geqq 2$. In fact, this equality holds for $n\geqq 3$, but for $n=2$, we have $N_{SL(2,C)}(B_2)=D$. By this mistake, we must correct Lemmas 4, 5, 6, 7, Proposition 8, and Theorem 9, though they hold true under the condition that $K\neq B_2$. The other results are OK without change. We correct these errors as follows. In Lemma 4, $N_{SL(2,C)}(B_n)=B_{2n}$ $(n\geqq 3)$, $N_{SL(2,C)}(B_2)=D$. In Lemma 5, $N_{GL(2,C)}(B_n)=\boldsymbol{C}^*I\cdot B_{2n}$ $(n\geqq 3)$, $N_{GL(2,C)}(B_2)=\boldsymbol{C}^*I\cdot D$. In Lemma 6, Case 2, for $K=B_n$ $(n\geqq 3)$, $u=\begin{pmatrix}\rho_{2n} & 0\\ 0 & \rho_{2n}^{-1}\end{pmatrix}$, and for $K=B_2$, $u=u_1:=\begin{pmatrix}\rho_4 & 0\\ 0 & \rho_4^{-1}\end{pmatrix}$ or $u=u_2:=\dfrac{1}{\sqrt{2}}\begin{pmatrix}\rho_4^3 & \rho_4^3\\ \rho_4 & -\rho_4\end{pmatrix}$. In case $K=B_2$, Lemma 7 should be replaced by

LEMMA 7'. *If* ($K=B_2$ *and if*) G *is indecomposable, then* G *can be expressed as either*

(a) $G=G_0\cup gG_0$,

where $G_0=\{c^2I\}\times H$, $c\in\boldsymbol{C}^*$, $|c|<1$, $g=cu_1$, *or*

(b) $G=G_0\cup gG_0\cup g^2G_0$,

where $G_0=\{c^3I\}\times H$, $c\in\boldsymbol{C}^*$, $|c|<1$, $g=cu_2$.

In case $K=B_2$, Proposition 8 should be replaced also by

PROPOSITION 8'. *If* $K=B_2$, *then* G *is conjugate to one of the following three groups;*

(a) $G=\{c^2I\}\times H\cup(cu_1)(\{c^2I\}\times H)$,

(b) $G=\{c^3I\}\times H\cup(cu_2)(\{c^3I\}\times H)\cup(cu_2)^2(\{c^3I\}\times H)$,

(c) $G=\{cI\}\times H$,

where $c\in\boldsymbol{C}^*$, $|c|<1$.

The statement (2) in Theorem 9 should read as follows;

(2)' (S^3/H)*-bundle over* S^1 *whose transition function* $u: S^3/H\to S^3/H$ *is of order* 2 *or* 3 *as an element of the diffeomorphism group of* S^3/H.

The correction of Lemma 6 is essential, and can be done by elementary group theoretic calculations. Here we use the fact that $S_3 := N_{SL(2,C)}(B_2)/B_2$ is the symmetric group of order 6 and that S_3 has only three conjugacy classes represented by the identity and the images of u_1 and u_2. The proof of Theorem 10 works also in the case $K=B_2$ though u is not determined uniquely, since any two groups belonging to distinct cases of (a), (b) and (c) in Proposition 8′ are not isomorphic to one another.

We note that, in case $K=B_2$, G is indecomposable if and only if G is conjugate in $GL(2, \boldsymbol{C})$ to one of the following three groups $\{H, g\}$; (1) $H=\{\lambda I, K\}$ and $g=cu_1$, (2) $H=\{\lambda I, K\}$ and $g=cu_2$, (3) $H=\{\lambda u_2, K\}$ and $g=cu_1$, where $c \in \boldsymbol{C}^*$, $|c|<1$, and λ is a root of unity. The corresponding transition functions of the (S^3/H)-bundle structures are of order 2 in cases (1) and (3), and of order 3 in case (2).

Masahide KATO
Department of Mathematics
Sophia University
Kioi-cho, Chiyoda-ku
102 Tokyo
Japan