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ERRATUM TO "PERIODIC HOMEOMORPHISMS OF 3-MANIFOLDS FIBERED OVER S^1"

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Theorem 5 in [1] is not true as stated for the case $p = 2$ and should be changed to read as shown below. Since Theorem 4 depends on this result a corresponding change is required here also.

THEOREM 4. *Suppose that $M(\varphi) = F \times R^1/\varphi$, where F is a closed, orientable surface of negative Euler characteristic and $H_1(M(\varphi); Q) \cong Q$. Let h: $M(\varphi) \to M(\varphi)$ be a map such that $h^p \simeq 1$ (for some prime p). In the case $p = 2$ and h_* is not the identity map on $H_1(M(\varphi); Q)$, assume additionally that φ^k is not homotopic to the identity map for any $k \neq 0$. Then there exists a PL homeomorphism g of $M(\varphi)$ such that $g \simeq h$ and $g^p = 1$.*

THEOREM 5. *Let $M(\varphi) = F \times R^1/\varphi$, where F is a closed orientable surface of negative Euler characteristic. Suppose that h is a homeomorphism of $M(\varphi)$ such that $h([F \times 0]) = [F \times 0]$ and h^p is homotopic to the identity for some prime p. In the case when $p = 2$ and h interchanges the sides of $[F \times 0]$, assume additionally that φ^k is not homotopic to the identity for any $k \neq 0$. Then there exists a homeomorphism h' of $M(\varphi)$ such that h' is homotopic to h and $h'^p = 1$.*

The proof for Theorem 5 in [1] breaks down in the case $p = 2$ and h interchanges the sides of $[F \times 0]$, since composing h with λ_s does not effect the degree of $f \circ H|\Sigma$ as asserted. To correct the proof it is sufficient to show that the degree of $f \circ H|\Sigma$ is already zero in this case.

Thus, assume $p = 2$ and h interchanges the sides of $[F \times 0]$. Split $M(\varphi)$ along $[F \times 0]$ to obtain $F \times [0, 1]$ and a homeomorphism $\hat{h}$ on $F \times [0, 1]$ induced by h. Then there exist homotopic homeomorphisms k and k' of F such that $\hat{h}(x, 0) = (k(x), 1)$ and $\hat{h}(x, 1) = (k'(x), 0)$. We can view $h|[F \times 0]$ in two ways: h: $[x, 0] \mapsto [k(x), 1] = [\varphi^{-1}k(x), 0]$ and h: $[x, 0] = [\varphi(x), 1] \mapsto [k'\varphi(x), 0]$. It follows that $\varphi^{-1}k = k'\varphi \simeq k\varphi$. If we let $g = \varphi^{-1}k$ this gives $h([x, 0]) = [g(x), 0]$ and $g \simeq \varphi g \varphi$. Now lift the homotopy H: $h^p \simeq 1$ to a homotopy $\tilde{H}$ of the covering space p: $F \times R^1 \to M(\varphi)$ defined by $p(x, t) = [x, t]$ such that $\tilde{H}_0(x, 0) = (g^2(x), 0)$. Then $\tilde{H}_1(x, t) = (\varphi^n(x), t + n)$ where

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$n = \deg(f \circ H|\Sigma)$. It follows that $g^2 \simeq \varphi^n$ which, when combined with $g \simeq \varphi g \varphi$, yields $\varphi^{2n} \simeq 1$. Thus $n = 0$ as needed.

References

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