ERRATUM TO
“EXOTIC SMOOTH STRUCTURES ON $3\mathbb{CP}^2\#n\overline{\mathbb{CP}^2}$”

B. DOUG PARK

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The proofs of Lemmas 2.2 and 4.2(ii) in [3] are incorrect as they assume that the numerical Godeaux surface in [1] is simply-connected as was claimed in that paper. From [2], we have learned that this surface may not be simply-connected after all.

However, we can still construct an infinite family of pairwise non-diffeomorphic irreducible 4-manifolds that are homeomorphic to $3\mathbb{CP}^2\#10\overline{\mathbb{CP}^2}$. One such construction can be given by slightly modifying the construction of an exotic $3\mathbb{CP}^2\#9\overline{\mathbb{CP}^2}$ in [4]. In the notation of [4], we can find an embedded sphere of self-intersection $-16$ in the 4-manifold $Z_{K_1,K_2,K_3}\#4\overline{\mathbb{CP}^2}$. This sphere is obtained by resolving the intersection of a pseudo-section of $Z_{K_1,K_2,K_3}$ and a single fishtail fiber (instead of two fishtail fibers as in [4]) and then blowing up at the three positive double points of the pseudo-section and at the double point of the fishtail fiber. Using twelve $(-2)$-spheres in the $I_{16}$ fiber, we can then extend this $(-16)$-sphere to the configuration $C_{14,1}$. Let $M_{K_1,K_2,K_3}$ denote the result of the rational blowdown of this configuration of spheres. The proof of Proposition 3.2 in [4] applies almost verbatim to show that $M_{K_1,K_2,K_3}$ is homeomorphic to $3\mathbb{CP}^2\#10\overline{\mathbb{CP}^2}$. By setting $K_1 = K_2 = K_3 = T_n$, the $n$-twist knot and mimicking the proof of Theorem 3.3 in [4], we can show that $M_n = M_{T_n,T_n,T_n}$ ($n = 1, 2, 3, \ldots$) are pairwise non-diffeomorphic irreducible 4-manifolds with inequivalent non-zero Seiberg-Witten invariants.

It remains an intriguing open problem whether the 4-manifolds $X$ and $P$ in [3] are simply-connected or not. Note that the 4-manifold $M$ in Section 4 of [3] is unaffected and still is an exotic $3\mathbb{CP}^2\#12\overline{\mathbb{CP}^2}$.

REFERENCES


Department of Pure Mathematics, University of Waterloo, Waterloo, ON, N2L 3G1, CANADA
E-mail address: bdpark@math.uwaterloo.ca

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