Erratum to: Foliations associated to harmonic maps on some complex two ball quotients

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In [Y, p. 1146, 1.35], it is stated that “ $P_{\mathbb{R}} \# T^2$ has a two-fold cover that is T^2 ”. This is a mistake. As a result, [Y, Theorem 4.2] should be corrected as follows. The numbering of the references follows [Y].

Theorem 4.2. *Let M be a smooth complex surface of general type with $c_2(M) = 3$. Then M is an arithmetic complex two ball quotient. Moreover, M is either a fake projective plane or a Cartwright-Steger surface. Hence, there are altogether 101 such surfaces.*

Proof. The surface M has to be a complex two ball quotient $B_{\mathbb{C}}^2/\Gamma$ as explained in [31, Proposition 2.1], where Γ is a cocompact lattice of $PU(2, 1)$. The lattice Γ is integral as explained in [Y, p. 1146]. An alternate proof is now available through the main result of [EG]. Arithmeticity of Γ is a consequence of integrality together with Archimedean rigidity as explained in the first half of [Y, p. 1146], following [Y, Lemma 4.1]. From [21] and [8], it follows from classification of arithmetic lattices with $c_2 = 3$ that M is either a fake projective plane ($b_1(M) = 0$) or a Cartwright-Steger surface ($b_1(M) = 2$). From [BY], it follows that there is exactly one Cartwright-Steger surface, since M can be defined over $\mathbb{Q}$ and the complex conjugate of M is biholomorphic to M (see [BY, Remark 5.1]). Together with the 50 pairs of fake projective planes classified in [21] and [8], this gives rise to 101 smooth surfaces with $c_2(M) = 3$. $\square$

References

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