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CORRECTION

Correction to: A lower bound on the solutions of Kapustin–Witten equations

Teng Huang[1]

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In Section 2 and Section 3 of the original version of the article, the author adapted several results from [12] and [16] to the Kapustin-Witten equations. Even though the Section 3 is not used anywhere in the proof of the main theorem 1.1 in original version of our article, the exposition of Theorem 2.4 and Section 3 followed Dr. Mares's thesis [12] closely and the original version of the article failed to cite Mares's thesis. The original version of the article also did not point out the similarity of Corollary 1.2 to [4,Corollary 2], Theorem 2.9 to [12, Theorem 4.2.1], did not give references to some Definitions in Pages 2,4,14,15,20. The author sincerely apologizes for these mistakes. The following list is the details.

• The conclusion of Corollary 1.2 is obtained from the setting of Kapustin-Witten equations, but the conditions of Corollary 1.2 are the same as those in [4,Corollary 2].

• The estimate in Theorem 2.4 is a standard application of the Weitzenböck formula. A similar estimate was proved for the Vafa-Witten equations in [12, Theorem 3.1.1]. In the setting of the Kapustin-Witten equations, it was proved in [16, Section 2(b)]. In original version of the article, we briefly review the proof of the statement for the readers' convenience.

• Following the strategy of [12, Theorem 4.2.1], we prove a unique continuation result (see Theorem 2.9) for the Kapustin-Witten equations.

• In Section 3, we study the regularity theory for the Kapustin-Witten equations. The exposition is modeled on the corresponding theory for the $PU(2)$ monopole equations [6]. The general pattern is that one typically has global L^2_1 estimates for solutions to the Kapustin-Witten equations, but when we need estimates with respect to stronger norms, we must get by with only local estimates. We also present the construction of

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✉ Teng Huang
oula143@mail.ustc.edu.cn

1 Department of Mathematics, University of Science and Technology of China, Hefei 230026, Anhui, People's Republic of China

the Kuranishi complex associated with the Kapustin-Witten equations in Section 3.1. The computations are standard in mathematical gauge theories, and our exposition is adapted from [12, Section 3.2.1]. Using methods from [6], Mares [12] studied the regularity of solutions of the Vafa-Witten equations. The arguments of [12] work verbatim for the Kapustin-Witten equations. The rest of Section 3 reviews the relevant results.
The Proposition 3.2 taken from Corollary 3.4 of [6], as described in Theorem 3.3.1 of [12].
The Proposition 3.3 taken from Corollary 3.11 of [6], as described in Theorem 3.3.3 of [12].
The Theorem 3.4 taken from Theorem 3.13 of [6], as described in Theorem 3.3.4 of [12].
The Proposition 3.5 taken from Theorem 3.3.5 of [12] which follows analogue of Corollary 3.15 in [6].
The Theorems 3.6, 3.7 taken from Theorems 3.3.6, 3.3.7 of [12].
• The statement of definition of the Kapustin-Witten equations in Page 2 taken from [16].
The statement of definition of Sololev space in Page 4 taken from Section 4.1 of [4].
The statement of definitions of $L^{\sharp}$ and $L^{\sharp,2}$ in Page 15 taken from Page 28 of [3].
The Definition 2.7 of irreducible connection in Page 7 taken form Definition 2.1 of Y. Tanaka, *Some boundedness properties of solutions to the Vafa-Witten equations on closed 4-manifolds,* Q. J. Math. **68** (2017), 1203–1225.
The definitions of gauge-equivariant map $VW(A, B, C)$ and VW-moduli space in Page 20 are first appear in [12]. The definitions of gauge-equivariant map $KW(A, \phi)$ and KW-moduli space in Page 3 follow from the setting of Vafa-Witten equations.