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Differential geometry

Corrigendum to “On anti-Hermitian metric connections” [C. R. Acad. Sci. Paris, Ser. I 352 (9) (2014) 731–735]

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Section 4 in the article [1] contains a sign error, i.e. the correct formula (9) of [1] should be read as follows:

$$S(X,Y) = -\frac{1}{2} J(\nabla_X J)Y.$$

Thus, the correct anti-Hermitian metric connection of type I is as follows:

$$\tilde{\nabla} = \nabla + S = \nabla - \frac{1}{2} J(\nabla J).$$

Also, from (4) and (14) of [1], we see that the torsion tensor of anti-Hermitian metric connection of type II is given by

$$T(X,Y) = -\frac{1}{2} J((\nabla_X J)Y - (\nabla_Y J)X).$$

Let now the triple (M, g, J) be an anti-Kähler–Codazzi manifold. Then from (3) of [1] we find that $T = 0$, i.e. in an anti-Kähler–Codazzi manifold the anti-Hermitian metric connection of type II reduces to a Levi–Civita connection. Due to this fact, we revise Theorem 5.2 of [1] as follows:

Theorem 5.2. *If an anti-Hermitian manifold is anti-Kähler–Codazzi, then the anti-Hermitian metric connection of type II coincides with the Levi–Civita connection of g.*

References

[1] A. Salimov, On anti-Hermitian metric connections, C. R. Acad. Sci. Paris, Ser. I 352 (9) (2014) 731–735.

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