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Erratum to "Riesz transforms on forms and L^p-Hodge decomposition on complete Riemanian manifolds"

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In [2], the author proved the martingale transform representation formulas for the Riesz transforms on forms over complete Riemannian manifolds, and derived the L^p-norm estimates of the Riesz on forms over complete Riemannian manifolds with suitable curvature conditions. Recently, Bañuelos and Baudoin [1] pointed out that there is an error in the martingale transform representation formulas (5.3) and (5.4) stated in [2] due to the fact that $e^{a\tau}M_{\tau,k\pm1}$ is not adapted with respect to the filtration $\mathcal{F}_t = \sigma(X_s, B_s, s \le t)$, and the proof of the L^p-norm estimates of the Riesz transforms given in [2] contained a gap. They proved a new martingale inequality which can be used to correct this gap.

As pointed out by Banuelos and Baudoin [1], the correct probabilistic representation formula of the Riesz transforms (5.3) and (5.4) in [2] requires placing the term $e^{-a\tau}M_{\tau,k\pm1}$ mentioned in the first paragraph above outside of the stochastic integrals used in various formulas in [2]. Indeed, we would like to say that a careful check of the original proof of Theorem 5.3 in [2] yields the correct representation formula. Using Theorem 2.6 in Bañuelos and Baudoin [1] and Propositions 6.2, 6.3 and 6.4 in [2], the main results proved in [2], i.e., Theorems 1.5, 1.6 and 1.9, remain valid. On the other hand, the upper bound $2(p^*-1)$ in (1.7) and (1.8) in page 486 should be replaced by "$C(p^*-1)^{3/2}$", and the upper bound "$C_k(p^*-1)$" in Theorems 1.7 and 1.8 should be replaced by "$C_k(p^*-1)^{3/2}$", where $C>0$ and C_k are constants.

More details on these corrections are contained in [3]. An alternative proof of the L^p-estimates without using Banuelos and Baudoin's inequality in [1], but with a constant which is less sharp than $C(p^*-1)^{3/2}$, is also given in [3].

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References

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