Spessato, Stefano
Pullback functors for reduced and unreduced $L^{p,q}$-cohomology. (English) Zbl 07587841
Ann. Global Anal. Geom. 62, No. 3, 533-578 (2022)

Summary: In this paper we study the reduced and unreduced $L^{p,q}$-cohomology groups of oriented manifolds of bounded geometry and their behavior under uniform maps. A uniform map is a uniformly continuous map such that the diameter of the preimage of a subset is bounded in terms of the diameter of the subset itself. In general, for each $p, q \in [1, +\infty)$, the pullback map along a uniform map does not induce a morphism between the spaces of $p$-integrable forms or even in $L^{p,q}$-cohomology. Then our goal is to introduce, for each $p$ in $[1, +\infty)$ and for each uniform map $f$ between manifolds of bounded geometry, an $L^p$-bounded operator $T_f$, such that it does induce in a functorial way the appropriate morphism in reduced and unreduced $L^{p,q}$-cohomology.

MSC:
37-XX Dynamical systems and ergodic theory
22-XX Topological groups, Lie groups

Keywords:
$L^{p,q}$-cohomology; bounded geometry; pullback; fiber volume

Full Text: DOI arXiv

References:
[1] Bei, F., Symplectic manifolds, $\langle L^p \rangle$-cohomology and $\langle q \rangle$-parabolicity, Differ. Geom. Its Appl., 64, 136-157 (2019) - Zbl 1416.53072
[2] Bei, F., On the $\langle L^2 \rangle$-Poincaré duality for incomplete Riemannian manifolds: a general construction with applications, J. Topol. Anal., 8, 1, 151-186 (2016) - Zbl 1404.58006
[3] Bott, R.; Tu, LW, Differential Forms in Algebraic Topology (1982), New York: Springer, New York, doi:10.1007/978-1-4757-3951-0
[4] Boucetta, M.; Essoufi, H., The geometry of the Sasaki metric on the sphere bundles of Euclidean Atiyah vector bundles, Mediterr. J. Math., 17, 6, 178 (2020) - Zbl 1453.53052
[5] Dieudonné, J., Treatise on Analysis (1972), London: Academic Press, London
[6] Dugundji, J., Topology (1966), Boston: Allyn and Bacon, Boston
[7] Durrett, R., Probability: Theory and Examples (2019), Cambridge: Cambridge University Press, Cambridge
[8] Eldering, J., Persistence of noncompact normally hyperbolic invariant manifolds in bounded geometry, C. R. Math., 350, 11-12, 617-620 (2012) - Zbl 1257.53054
[9] Getzler, E.: The Thom class of Mathai and Quillen and probability theory. doi:10.1007/978-1-4612-0447-3-8 (1991) - Zbl 0753.58034
[10] Gol'dshtein, V.; Troyanov, M., Sobolev inequality for differential forms and $\langle L^q \rangle$-cohomology, J. Geom. Anal., 16, 4, 597-631 (2006) - Zbl 1105.58008
[11] Gol'dshtein, V.; Kopylov, Y., Some calculations of Orlicz cohomology and Poincare-Sobolev-Orlicz inequalities, Sib. Elektrom. Mat. Izv., 16, 1079-1090 (2019) - Zbl 1440.60001
[12] Greub, W.; Halperin, S.; Vanstone, R., Connections, Curvature, and Cohomology (1972), London: Academic Press, London
[13] Hatcher, A.: Vector Bundles and K-Theory, Version 2.2 (2017). https://pi.math.cornell.edu/~hatcher/VBKT/VBpage.html
[14] Hilsun, M., Skandalis, G.: Invariance par homotopie de la signature a coefficients dans un fibre presque plat. Journal für die reine und angewandte Mathematik 1992 (1992) - Zbl 0731.55013
[15] Lee, J., Introduction to Smooth Manifolds (2003), Berlin: Springer, Berlin, doi:10.1007/978-0-387-21752-9
[16] Mathai, V.; Quillen, D., Superconnections, Thom classes and equivariant differential forms, Topology, 25, 85-110 (1986) - Zbl 0592.55015
[17] Iwaniec, T.; Kauhanen, J.; Kravetz, A.; Scott, C., Hadamard-Schwartz inequality. J. Funct. Spaces Appl., 2, 2, 1 (2004) - Zbl 1049.58003
[18] Sasaki, S.: On the differential geometry of tangent bundles of Riemannian manifolds. Tohôoku Math. J. I 10, 338-354 (1958); II 14, 146-155 (1962) · Zbl 0109.40505

[19] Schick, T., Manifolds with boundary and of bounded geometry, Math. Nachr., 223, 103-120 (2001) · Zbl 1037.53016 · doi:10.1002/1522-2616(200103)223:1<103::AID-MANA103>3.0.CO;2-S

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.