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MR703475 (85c:57028) Hurder, Steven (1-PRIN) Vanishing of secondary classes for compact foliations. J. London Math. Soc. (2) 28 (1983), no. 1, 175–183. 57R30

Journal



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The author proves that the Godbillon-Vey class of a compact foliation (one in which all the leaves are compact) vanishes, as do all the "residuable" secondary classes. In codimension one Duminy (unpublished) has shown the stronger result that for a foliation with no resilient leaves the Godbillon-Vey class vanishes. In codimension two, R. D. Edwards, K. C. Millet and D. Sullivan [Topology 16 (1977), no. 1, 13–32; MR 55 #11268] have a structure theory that implies that a foliation with all leaves compact is a Riemannian foliation and all its secondary classes vanish. In codimension three and greater the author proceeds as follows. By multiplying the form representing the secondary class by a closed form one sees that it suffices to show that an integral over the manifold vanishes. The author uses the Epstein filtration [D. B. A. Epstein, Ann. of Math. (2) 95 (1972), 66–82; <u>MR 44#5981</u>] of the bad set of the foliation to decompose this integral into a sum of integrals over saturated sets which are products, foliated with the product foliation. The secondary class decomposes into a corresponding product and the integral of one factor over a leaf is proportional to a leaf class. Since the leaf classes of a compact foliation are all identically zero, all these integrals vanish.

Reviewed by John Cantwell

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