

Item: 1 of 1 | [Return to headlines](#)[MSN-Support](#) | [Help Index](#)Select alternative format: [BibTeX](#) | [ASCII](#)**MR852160** (87m:57030)**Hurder, S.****The Godbillon measure of amenable foliations.***J. Differential Geom.* **23** (1986), no. 3, 347–365.[57R30](#)[Journal](#)[Article](#)[Doc Delivery](#)**References: 0****Reference Citations: 0****[Review Citations: 1](#)**

G. Duminy [“L’invariant de Godbillon-Vey d’un feuilletage se localise dans les feuilles ressort”, Preprint, Univ. Lille, Lille, 1982; per revr.] gave an elegant solution to the conjecture that a C^2 , codimension-one foliation of a compact manifold M with nonzero Godbillon-Vey class must have leaves with exponential growth. In fact Duminy proved that every such foliation must have a resilient leaf and thus there must be an open subset of M consisting of leaves with exponential growth. For a history of the problem and a published version of Duminy’s proof see a paper by the reviewer and L. Conlon [Adv. in Math. **53** (1984), no. 1, 1–27; [MR 87b:57019](#)]. The author generalizes Duminy’s result to C^2 , codimension- n foliations \mathcal{F} of an open or compact m -manifold M without boundary. He shows that, if for some Riemannian metric on M , almost every leaf of the foliation has subexponential growth, then all Godbillon-Vey classes in $H^{2n+1}(M)$ are zero as well as the generalized Godbillon-Vey classes of degree greater than $2n + 1$. The author simplifies and extends Duminy’s proof. If ω is the defining n -form for \mathcal{F} then $d\omega = \omega \wedge \eta$ with η a smooth 1-form on M . The Chern-Weil construction, using a basic connection, yields a closed form c_J on M of degree $2n$. The Godbillon-Vey classes of \mathcal{F} are the classes in the collection $\{[\eta \wedge c_J] : \text{weight } c_J = n\} \subset H^{2n+1}(M)$. These are invariants of the concordance class of \mathcal{F} . For each $B \in \mathcal{B}$, the Σ -algebra of measurable subsets of M , there is a functional $g_B: H^{m-1}(M, \mathcal{F}) \rightarrow \mathbf{R}$ defined by $g_B[\varphi] = \int_B \eta \wedge \varphi$. The correspondence $B \rightarrow g_B$ is called the Godbillon measure on B . The vanishing of this measure implies the vanishing of all the Godbillon-Vey classes. An important tool in proving the vanishing of the Godbillon-Vey measure is the ε -tempering process [see the author and A. Katok, “Ergodic theory and Weil measures of foliations”, Ann. of Math. (2), to appear].

Reviewed by [John Cantwell](#)

© Copyright American Mathematical Society 1987, 2004