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Cohomologie des Formes Divergences et Actions Propres d'Algèbres de Lie

For any action $\tau: \mathcal{G} \rightarrow \mathcal{V}(M)$ of a Lie algebra \mathcal{G} on a manifold M , we introduce the notion of a cohomology $H_\tau^*(M)$ which we call the cohomology of τ -divergence forms. We show that this cohomology is invariant by a \mathcal{G} -proper homotopy, and that there exists an analogue of the Mayer-Vietoris lemma. We make the connection with the problem of integrability of a Lie algebra action to a proper Lie group action. The differentiable cohomology $H_d^*(G)$ of a unimodular Lie group G is isomorphic to $H_\tau^{*+1}(G/K)$ (where K a compact maximal subgroup of G and $\tau: \mathcal{G} \rightarrow \mathcal{V}(G/K)$ is the natural homogeneous action of the Lie algebra \mathcal{G} of G).

Keywords: G -manifolds, cohomology, noncompact Lie groups of transformations, compact Lie groups of differentiable transformations.

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