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Leibniz Cohomology for Differentiable Manifolds

In this talk we extend Loday's Leibniz cohomology, HL^*, from a Lie algebra invariant to a new invariant for differentiable manifolds. The extension is achieved via a cochain complex of tensors (from differential geometry), and as such generalizes the de Rham complex of differential forms. To be sure, HL^* becomes a non-commutative version of Gelfand-Fuks cohomology. These new cohomology groups are diffeomorphism invariants, but fail to be homotopy invariants. The first obstruction to the homotopy invariance of HL^* is the universal Godbillon-Vey invariant in dimension $2n+1$ for the Leibniz cohomology of Euclidean n-space. We present the calculation for $HL^*(R^n)$ in terms of (i) certain invariants of foliations and (ii) Loday's product structure on HL^*.

Reference: Leibniz Cohomology for Differentiable Manifolds, to appear in *Annales de l'Institut Fourier.*