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A review of the modular class of a Q-manifold

Abstract

Q-manifolds are supermanifolds equipped with a Grassmann odd vector field that self-commute, such vector field are called homological. Such objects are found in mathematical physics behind the BV-BRST and BFV formalism of gauge theory, as well as appearing in Poisson geometry in the guise of Lie algebroids. In this talk we revisit the notion of the modular class of a Q-manifold understood as the obstruction to the existence of a Berezin volume that is invariant with respect to the Lie derivative of the homological vector field. In this way we in fact construct a characteristic class of the Q-manifold as first discovered by Lyakhovich & Sharapov (2004). Although these notions seem to be known to experts little has appeared in the literature. I will sketch the main ideas and illustrate the general theory with some new examples such as the modular class of a double Lie algebroid.