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Anomalous Ward identities in the BV-BRST formulation of quantum gauge theories

We show that every (graded) derivation on the algebra of free quantum fields and their Wick powers in curved spacetimes gives rise to a set of anomalous Ward identities for time-ordered products, with an explicit formula for their classical limit. We study these identities for the Koszul–Tate and the full BRST differential in the BV–BRST formulation of perturbatively interacting quantum gauge theories, and show that the quantum BRST differential, the quantum antibracket and the higher-order anomalies form an L_∞ algebra. The defining relations of this algebra ensure that the gauge structure is well-defined on cohomology classes of the quantum BRST operator, i.e., on the interacting observables. Furthermore, we show that one can determine contact terms such that also the interacting time-ordered products of multiple interacting fields are well defined on cohomology classes. The talk is based on arXiv:1803.10235.