A Proof of Tsygan’s Formality Conjecture for an Arbitrary Smooth Manifold

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Abstract
Proofs of Tsygan’s formality conjectures for chains formulated in math.QA/9904132 would unlock important algebraic tools which might lead to new generalizations of the famous Atiyah-Singer index theorem and Riemann-Roch-Hirzebruch theorem. Despite this pivot role in the traditional investigations and the efforts of various people the most general version of Tsygan’s formality conjecture has not yet been proven. In my recent paper math.QA/0402248 I have proven Tsygan’s formality conjecture for Hochschild chains of the algebra of functions on an arbitrary smooth manifold using the Fedosov resolutions proposed in math.QA/0307212 and the formality quasi-isomorphism for Hochschild chains of $R[[y_1, ..., y_d]]$ proposed in paper math.QA/0010321 by Shoikhet. In my talk I will formulate Tsygan’s formality conjecture, outline the idea of the proof, and say a couple of words about applications of this result to computation of Hochschild homology of quantum algebras and description of traces in deformation quantization.