

# Formality for the homotopy calculus algebra of Hochschild (co)chains

## Abstract

The standard Cartan calculus on polyvector fields and exterior forms can be naturally extended to the Hochschild cohomology and the Hochschild homology of an arbitrary associative algebra  $A$ . Recent results of M. Kontsevich and Y. Soibelman imply that this calculus on Hochschild (co)homology can be naturally upgraded to a homotopy calculus structure on the pair  $(C^\bullet(A), C_\bullet(A))$  “Hochschild cochains + Hochschild chains” of an associative algebra  $A$ . In my talk I will consider the sheaf of homotopy calculi  $(C^\bullet(\mathcal{O}_X), C_\bullet(\mathcal{O}_X))$  for a smooth algebraic variety  $X$  with  $\mathcal{O}_X$  being the structure sheaf. I will show that this sheaf  $(C^\bullet(\mathcal{O}_X), C_\bullet(\mathcal{O}_X))$  of homotopy calculi is quasi-isomorphic to its cohomology. I will also talk about applications of this result. My talk will be based on joint paper arXiv:0807.5117 with D. Tamarkin and B. Tsygan. The main result of this paper was announced by D. Tamarkin in 2000 at the Moshé Flato memorial conference.