

**Lecture Series: Observables in the effective BV-formalism; Talk 6:
Some examples of BV-quantization**

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We discuss two nontrivial examples of quantum field theories in the effective BV-formalism developed in [1]. Both of these examples involve quantum corrections at all loops.

The first is a one-dimensional σ -model, describing topological quantum mechanics discussed in [2]. The effective BV quantization is equivalent to the geometric model of Fedesov's Abelian connections on Weyl bundles. It leads to a simple approach to deformation quantization and algebraic index theorem on symplectic manifolds.

The second is a two-dimensional model describing chiral deformations of conformal field theories, which arises naturally from topological B-model on elliptic curves. Much of this work can be found in [3]. The effective BV-quantization is equivalent to integrability of infinitely many commuting chiral operators. The partition function is equivalent to the higher genus GW invariants on elliptic curves, which is an incidence of mirror symmetry.

REFERENCES

- [1] K. Costello and O. Gwilliam, *Factorization algebras in quantum field theory, Volume I & II*, Cambridge University Press (submitted), 2015.
- [2] R. Grady, S. Li, Q. Li, *BV-quantization and the algebraic index*, arXiv:1507.01812 (submitted), 2015.
- [3] S. Li, *Calabi-Yau Geometry and Higher Genus Mirror Symmetry*, Thesis, Harvard University, May 2011.