

FROM BIALGEBRAS TO OPERADS.
QUANTUM LINE AND COOPERAD
OF CORRELATION FUNCTIONS

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S u m m a r y

A q -line is a simple example of a braided Hopf algebra. This is just an algebra of polynomials $\mathbb{k}_q[z]$ with primitive generator and q -deformed statistics.

The (co)action of a q -line on an algebra is a q -derivation. We construct an operad and a cooperad from a bialgebra. In the case of a q -line, this construction is related to the cooperad of correlation functions of I. Kriz *et al.*, which describes vertex algebras.

Modules over the factor-algebra $\mathbb{k}_q[z]/(z^N)$ are N -complexes. We consider a homotopical category of N -complexes as an example of the q -analog of Maltsiniotis' strongly triangulated category.

The general constructions are considered in the context of iterated monoidal categories with unbiased lax tensor products described in the terms of the Gray tensor products of 2-fold categorical operads of sequential trees Tree .