A Combinatorial Approach to Coefficients in Deformation Quantization

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Abstract - Graph cocycles for star-products are investigated from the combinatorial point of view.

The Hochschild complex, controlling the deformation theory of associative algebras, is the "Kontsevich representation" of a DGLA of graphs coming from a pre-Lie algebra structure defined by graph insertions.

The properties of the dual of its UEA (an odd parity analog of Connes-Kreimer Hopf algebra), are investigated in order to find solutions of the deformation equation. The solution of the initial value deformation problem, at tree-level, is unique.

Key words and phrases : deformation quantization, cohomology, Feynman graphs, Hausdorff series

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