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Hopf-algebraic Renormalization of Multiple Zeta Values and their q-analogues

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Multiple zeta values are real numbers which appeared in depth one and two in the work of L. Euler in the Eighteenth century. They first appear as a whole in the work of J. Ecalle in 1981, as infinite nested sums. A systematic study starts one decade later with M. Hoffman, D. Zagier and M. Kontsevich, with multiple polylogarithms and iterated integral representation as a main tool. After a brief historical account, I'll explain how a quasi-shuffle compatible definition (by no means unique) can be given through Connes-Kreimer's Hopf-algebraic renormalization when the nested sum diverges. I'll also give an account of the more delicate renormalization of shuffle relations. Finally, I'll introduce the Ohno-Okuda-Zudilin model of q-analogues for multiple zeta values, and describe the algebraic structure which governs it.

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