

*The algebraic and geometric structures of exotic aromatic
Butcher series for the backward error analysis of ergodic
stochastic differential equations*

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The exotic aromatic Butcher series formalism is a strong tool for the creation of high-order integrators for sampling the invariant measure of ergodic SDEs. In this talk, we uncover a universal geometric characterisation of exotic aromatic series and the Hopf algebra structures related to the composition and substitution laws of exotic aromatic series. In particular, we describe backward error analysis with exotic aromatic series and give an explicit expression of the modified vector field at any order.

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