

Exotic B-series and S-series: algebraic structures and order conditions for invariant measure sampling

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B-series and generalizations are a powerful tool for the analysis of numerical integrators. An extension named exotic aromatic B-series was introduced to study the order conditions for sampling the invariant measure of ergodic SDEs. In this talk, we analyze the algebraic structures related to exotic B-series and S-series. Applying this algebraic framework to the derivation of order conditions for a class of stochastic Runge-Kutta methods, we present a multiplicative property that ensures some order conditions to be satisfied automatically.