Numerical Solution of multi-Wiener process SDEs

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Abstract:

There are few extant numerical methods available for solving SDEs with multiple Wiener processes, especially in the case that the functions defining the SDE do not commute.

A recent attempt at deriving a method suitable for this required the calculation of commutators - but this can become expensive.

I present here a new class of methods that circumvents the calculation of commutators; numerical results are presented to demonstrate that explicit methods in this class are suitable for non-stiff SDEs; in addition, an implicit method in this class is derived and is suitable for stiff SDEs; numerical results confirm the effectiveness of this approach.