

Probabilistic sampling for physics: finding needles in a field of high-dimensional haystacks

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Type: **Non spécifié**

Splitting schemes for second order approximations of piecewise-deterministic Markov processes

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Piecewise deterministic Markov processes (PDMPs) received substantial interest in recent years as an alternative to classical Markov chain Monte Carlo algorithms. While theoretical properties of PDMPs have been studied extensively, their practical implementation remains limited to specific applications in which bounds on the gradient of the negative log-target can be derived. In order to address this problem, we propose to approximate PDMPs using splitting schemes, that means simulating the deterministic dynamics and the random jumps in two different stages. We show that as expected basic symmetric splittings of PDMPs are of second order. Then we focus on the Zig-Zag sampler (ZZS) and illustrate with numerical simulations the advantages of our proposed scheme over competitors.

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Classification de Session: Result Communication