

Accepted Manuscript

Convergence and stability of the split-step theta method for stochastic differential equations with piecewise continuous arguments

Y.L. Lu, M.H. Song, M.Z. Liu

PII: S0377-0427(16)30575-1

DOI: <http://dx.doi.org/10.1016/j.cam.2016.11.033>

Reference: CAM 10906

To appear in: *Journal of Computational and Applied Mathematics*

Received date: 10 July 2016

Revised date: 27 October 2016



Please cite this article as: Y.L. Lu, M.H. Song, M.Z. Liu, Convergence and stability of the split-step theta method for stochastic differential equations with piecewise continuous arguments, *Journal of Computational and Applied Mathematics* (2016), <http://dx.doi.org/10.1016/j.cam.2016.11.033>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Highlights

1. The split-step theta (SST) method is implemented to stochastic differential equations with piecewise continuous arguments (SDEPCAs) in which both the drift and the diffusion coefficients do not satisfy the global Lipschitz and linear growth conditions, especially the diffusion coefficients are highly non-linear growing.
2. The strong convergence of SST method with $\theta \in [1/2, 1]$ is proved under the local Lipschitz, monotone and one-sided Lipschitz conditions.
3. It is obtained that the SST method with $\theta \in (1/2, 1]$ preserves the exponentially mean square stability of SDEPCAs under the monotone condition and some condition on the step-size.
4. It is also obtained that the SST method with $\theta \in (1/2 + 1/2\sqrt{\lambda_2/\lambda_1}, 1]$ preserves the exponentially mean square stability for all step-size $(0 < \lambda_2 < \lambda_1)$.

Download English Version:

<https://daneshyari.com/en/article/5776320>

Download Persian Version:

<https://daneshyari.com/article/5776320>

[Daneshyari.com](https://daneshyari.com)