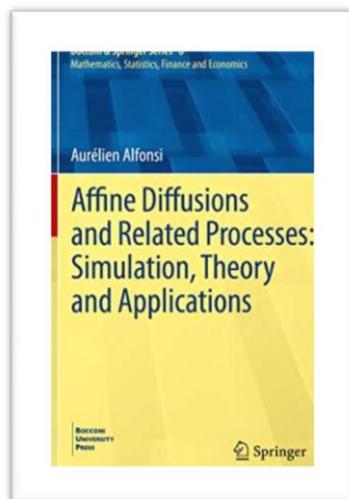


BOOK REVIEW

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**AFFINE DIFFUSIONS AND RELATED PROCESSES:
SIMULATION, THEORY AND APPLICATIONS**

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INTRODUCTION

The book **Affine Diffusions and Related Processes: Simulation, Theory and Applications**, 978-3-319-05221-2, is the Springer Series *B&SS-Bocconi & Springer Series* Volume 6. The purpose of this series, whose Editors-in-Chief are Lorenzo Peccati and Sandro Salsa, is to publish research monographs and advanced textbooks covering a wide variety of topics in the fields of mathematics, statistics, finance, economics and financial economics. In what respects textbooks, it's main target is to provide an educational core at a typical Master's degree level, publishing books and also offering extra material that can be used by teachers, students and researchers. The author, **Aurélien Alfonsi** is affiliated in CERMICS, Ecole Nationale des Ponts et Chaussées, Champ-Sur- Marne, France.

It is organized in six chapters:

1. Real Valued Affine Diffusions
2. An Introduction to Simulation Schemes for SDEs
3. Simulation of the CIR Process
4. The Heston Model and Multidimensional Affine Diffusions
5. Wishart Processes and Affine Diffusions on Positive Semidefinite Matrices
6. Processes of Wright-Fisher Type

Two useful annexes are also included:

- A. Some Results on Matrices
- B. Simulation of a Gamma Random Variable

As it results from the above description, this book subject is mainly the simulation, together with the theory and applications, of affine diffusions and related processes. It is very well known these stochastic processes application in modeling the real world phenomena. The affine diffusions are of major importance in finance. The related processes considered, Wright-Fisher processes, in the 6th chapter, are important in biology.

Also simulation is an important tool in data analysis and modeling. This is enough to explain the interest of this book especially as the author states in the preface that “the main goal of this book is to present recent developments with respect to the simulation of affine diffusions”.

THE REVIEW

This academic text is very well written and organized. It begins by the bases, in chapters 1.2 and 3 (partially), and then goes to the main objective in chapters 3 (partially), 4, 5 and 6. The annexes A and B give useful material support to the text. The book may be considered self-contained since in it is presented an overview of affine diffusions: from Ornstein-Uhlenbeck processes to Wishart processes, and related stochastic processes: Wright-Fisher processes. It presents also different simulation schemes for these processes, with an emphasis to second-order schemes for the weak error.

Some models, built with affine diffusions, mostly in the field of finance, in which study these processes are relevant, are presented and its use exemplified.

Summarizing, the reader can find in this book an explanation of the mathematical background to understand affine diffusions and related processes and analyze the accuracy of the schemes.

The text fits a high pedagogical quality and a scientific high level. It is a mathematical text very rigorous. Despite this, it is agreeable to read, very interesting and even pleasant.

OVERALL REVIEW

This is a very interesting book adequate to support Master or PhD courses in Stochastic Processes, dealing very cleverly with the Affine Diffusions and Related Processes and the respective simulation. Also remarkable due to the models, in the field of finance, presented. Having a very high scientific standard, but written in a pedagogical style, it is accessible to larger audiences and very useful for finance professionals.

REFERENCE

Aurélien Alfonsi, Affine Diffusions and Related Processes: Simulation, Theory and Applications, *B&SS-Bocconi & Springer Series*, Volume 6. Springer International Publishing, Switzerland 2015.