Geometrical Properties
of Differential Equations

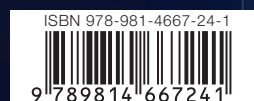## Applications of Lie Group Analysis
in Financial Mathematics

This textbook is a short comprehensive and intuitive introduction to the Lie group analysis of ordinary and partial differential equations. This practical-oriented material contains a large number of examples and problems accompanied by detailed solutions and figures. In comparison with the known beginner guides to Lie group analysis, the book is oriented toward students who are interested in financial mathematics, mathematical finance and economics.

We provide the results of the Lie group analysis of actual models in Financial Mathematics using recent publications. These models are usually formulated as nonlinear partial differential equations and are rather difficult to make use of. With the help of Lie group analysis it is possible to describe some important properties of these models and to obtain some interesting reductions in a clear and understandable algorithmic way.

The book can serve as a short introduction for a further study of modern geometrical analysis applied to models in financial mathematics. It can also be used as textbook in a master's program, in an intensive compact course, or for self study.

The textbook with a number of examples will be useful not only for students who are interested in Financial Mathematics but also for people who are working in other areas of research that are not directly connected with Physics (for instance in such areas of Applied Mathematics like mathematical economy, bio systems, coding theory and etc.).

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