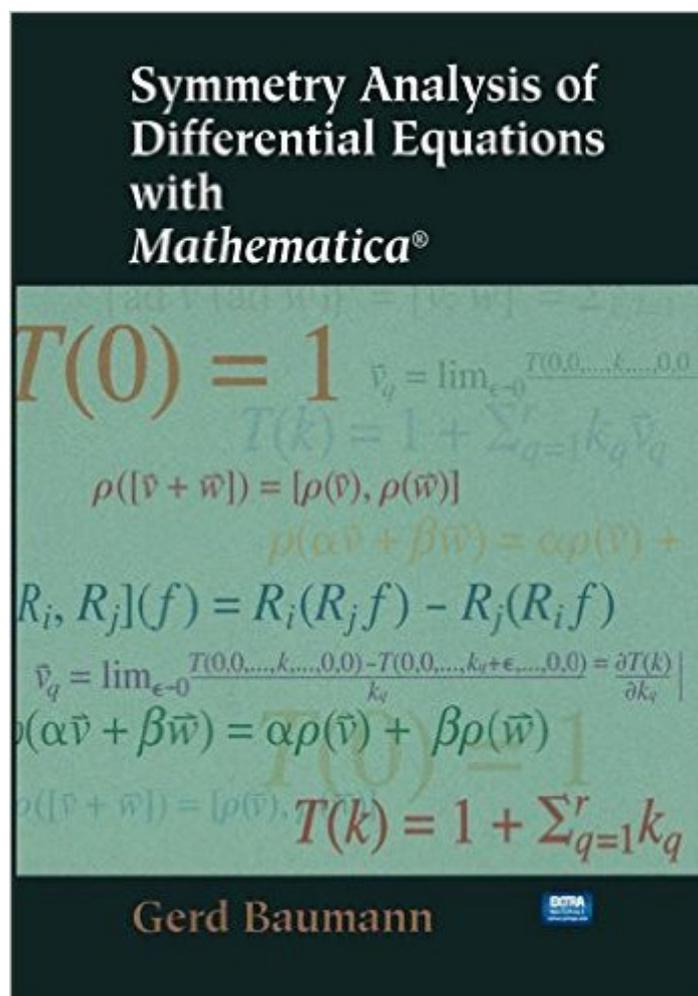


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# Symmetry Analysis Of Differential Equations With Mathematica®



## Synopsis

The first book to explicitly use Mathematica so as to allow researchers and students to more easily compute and solve almost any kind of differential equation using Lie's theory. Previously time-consuming and cumbersome calculations are now much more easily and quickly performed using the Mathematica computer algebra software. The material in this book, and on the accompanying CD-ROM, will be of interest to a broad group of scientists, mathematicians and engineers involved in dealing with symmetry analysis of differential equations. Each section of the book starts with a theoretical discussion of the material, then shows the application in connection with Mathematica. The cross-platform CD-ROM contains Mathematica (version 3.0) notebooks which allow users to directly interact with the code presented within the book. In addition, the author's proprietary "MathLie" software is included, so users can readily learn to use this powerful tool in regard to performing algebraic computations.

## Book Information

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## Customer Reviews

Before giving my opinion I would like to point out that there is a very negative review of this book by Dr. P.A. Clarkson. It appeared in SIAM Review, Vol. 43, No. 3, pp. 549-581. Now for my opinion. I am doing research in nonlinear PDEs. What I need is a good Mathematica package to take me through the tedious calculations. Unfortunately, MathLie package included with the book does not meet my needs. I have often encountered very cryptic error messages produced by the package internal functions. I could not find the root causes of those errors, because these functions are not

accessible. This makes the results of the calculations suspect. In some cases they do not agree with published results. Dr. Clarkson in his above-mentioned review reports similar experience. Most importantly, the book really does not help to interpret the output produced by the package. The online help is very inadequate. I cannot recommend this book as either a textbook (too cryptic) or a research reference/tool (results are suspect). In summary, I agree with Dr. Clarkson that "this book should have never been published". I only wish I saw his review before making a mistake of purchasing it. Instead of this book I recommend "Introduction to Symmetry Analysis" by B. Cantwell, which is much more readable and provides a Mathematica package.

I regret the time and money expended in acquiring the following information. In no way can I recommend this book to any reader. This work is incoherent and reflects the incoherence of the design of the MathLie Mathematica Package. The text is neither an adequate introduction to the package nor a suitable reference. Descriptions of functions are locally incomplete and globally scattered throughout the book. Only after considerable searching does one find that, in fact, there is little functionality for the solution of any but the most trivial systems. As a tool to learn applications of Lie Groups to Differential Equations, this text is useful only insofar as it represents the thinnest introduction to the material, suitable neither for the expert nor the novice. As a tool to expand the capabilities of Mathematica, it is a pointless exercise in using essentially undocumented encrypted code with no evident organizational principle. One may well do better to seek help from a divining rod.

I bought the book, but the CD-ROM did not come together. I need it for my work.

A good book. If you know Mathematica 3 or later, a little of differential geometry, is a good way to do symmetries in differential equations.

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