Description Springer

springer.com

Alain Vande Wouwer Philippe Saucez Carlos Vilas

Simulation of ODE/PDE Models with MATLAB[®], OCTAVE and SCILAB

Scientific and Engineering Applications

🖄 Spring

2014, XV, 406 p. 141 illus., 33 illus. in color. With online files/update.

Printed book

EXTRA

Hardcover

- ▶ 129,99 € | £117.00 | \$179.00
- *139,09 € (D) | 142,99 € (A) | CHF 173.50

🥑 eBook

Available from your library or

springer.com/shop



Printed eBook for just

- ▶ €|\$24.99
- springer.com/mycopy

A. Vande Wouwer, P. Saucez, C. Vilas

Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB

Scientific and Engineering Applications

- Worked examples in the text provide a practical introduction to the solution techniques presented
- Collection of codes available for download includes not only solution algorithms for examples in the text but also application examples in various areas of science and engineering
- A Toolbox is available for MATLAB[®] but also for open-source alternatives Octave and Scilab

Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB shows the reader how to exploit a fuller array of numerical methods for the analysis of complex scientific and engineering systems than is conventionally employed. The book is dedicated to numerical simulation of distributed parameter systems described by mixed systems of algebraic equations, ordinary differential equations (ODEs) and partial differential equations (PDEs). Special attention is paid to the numerical method of lines (MOL), a popular approach to the solution of time-dependent PDEs, which proceeds in two basic steps: spatial discretization and time integration.

Besides conventional finite-difference and -element techniques, more advanced spatialapproximation methods are examined in some detail, including nonoscillatory schemes and adaptive-grid approaches. A MOL toolbox has been developed within MATLAB[®]/ OCTAVE/SCILAB. In addition to a set of spatial approximations and time integrators, this toolbox includes a collection of application examples, in specific areas, which can serve as templates for developing new programs.

Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB provides a practical introduction to some advanced computational techniques for dynamic system simulation, supported by many worked examples in the text, and a collection of codes available for download from the book's page at www.springer.com. This text is suitable for self-study by practicing scientists and engineers, and as a final-year undergraduate course or at the graduate level.



The first \in price and the \pm and \$ price are net prices, subject to local VAT. Prices indicated with * include VAT for books; the \in (D) includes 7% for Germany, the \in (A) includes 10% for Austria. Prices indicated with ** include VAT for electronic products; 19% for Germany, 20% for Austria. All prices exclusive of carriage charges. Prices and other details are subject to change without notice. All errors and omissions excepted.

