



Solving ordinary differential equations ii : stiff and differential-algebraic problems

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Monografía

The subject of this book is the solution of stiff differential equations and of differential-algebraic systems (differential equations with constraints). There is a chapter on one-step and extrapolation methods for stiff problems, another on multistep methods and general linear methods for stiff problems, a third on the treatment of singular perturbation problems, and a last one on differential-algebraic problems with applications to constrained mechanical systems. The beginning of each chapter is of introductory nature, followed by practical applications, the discussion of numerical results, theoretical investigations on the order and accuracy, linear and nonlinear stability, convergence and asymptotic expansions. Stiff and differential-algebraic problems arise everywhere in scientific computations (e.g. in physics, chemistry, biology, control engineering, electrical network analysis, mechanical systems). Many applications as well as computer programs are presented. Ernst Hairer and Gerhard Wanner were jointly awarded the 2003 Peter Henrici Prize at ICIAM 2003 in Sydney, Australia

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