Daspk 3.0 And Daspkadjoint: A New Software Package For Simulation and Sensitivity Analysis of Differential-Algebraic Equation Systems

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BRIEF DESCRIPTION

A software package for forward sensitivity analysis of differential-algebraic equation systems of index up to two, which can be used in sensitivity analysis and design optimization of several large-scale engineering problems.

BACKGROUND

In recent years there has been a growing interest in sensitivity analysis for large-scale systems governed by both differential algebraic equations (DAEs). The results of DAE simulation and sensitivity analysis have wide-ranging applications in science and engineering.

DESCRIPTION

Researchers at the University of California, Santa Barbara have been involved in the development of DAE system solvers from their earliest stages, including DASSL and DASPK1.0. Most recently, researchers have developed the DASPK3.0 software package for forward sensitivity analysis of differential-algebraic equation systems of index up to two, and have been used in sensitivity analysis and design optimization of several large-scale engineering problems. DASPK3.0 is an extension of the DASPK software developed for the solution of large-scale DAE systems.

DASPKADJOINT is an extension to DASPK3.0 which accompanies the DAE solution with adjoint sensitivity analysis.

ADVANTAGES

- Forward (direct) sensitivity analysis
- Adjoint sensitivity analysis via DASPKADJOINT
- Enhanced algorithm for calculation of consistent initial conditions for index-zero or index-one systems
- Capability of initializing and solving index-2 systems
- More accurate error and convergence test
- Efficiency improvements
- Highly scalable

APPLICATIONS

- Solution and sensitivity analysis of differential-algebraic equations

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OTHER INFORMATION

CATEGORIZED AS

- **Computer**
  - Software

RELATED CASES

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This technology is available for licensing.

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