Isochronous Time Integration Algorithms

Technology #20130092

Engineering Applications Next Generation Toolkit

iINTEGRATORS is a single-step, single-solve, unified framework of algorithms encompassing the class of second-order, time-accurate least mean square (LMS) methods for both 1st and 2nd order time dependent systems. The framework, which takes a single set of inputs and produces the appropriate output using a single selected algorithm. It could serve as a next generation toolkit for computational science and engineering applications and could act as a primary computation for computer-aided engineering (CAE) software that simulates stresses, heat transfer, fluid movement and other physical properties on CAD/CAM models for transient/dynamic simulations. iINTEGRATORS provides a wide variety of choices and includes new and optimal algorithms and designs in addition to existing algorithms.

Enhances CAE Simulations

Currently, mechanical engineering simulation encompasses numerous types of algorithms based on the problem at hand, all of which are distinctly different, and specialized software packages are used for specific purposes. iINTEGRATORS significantly simplifies this process. Its higher level algorithm by design framework encompasses a wide variety of computational simulation algorithms and therefore doesn’t face the same limitations as problem specific algorithms.

BENEFITS AND FEATURES:

- Significantly simplifies and enhances CAE simulation process
- Single-step, single-solve algorithms by design framework
- Encompasses class of LMS methods with second order time accuracy for 1st and 2ndorder systems

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• Takes a single set of inputs and produces the appropriate output using a single selected algorithm
• Next generation toolkit for computational science and engineering applications
• Primary computational workhorse for CAE software
• More optimal, more redundant
• Works with most cases while maintaining the same execution speed
• Doesn’t face the same limitations as problem specific algorithms

APPLICATIONS:
• Computational sciences
• Engineering applications
• CAE software
• Simulating stresses, heat transfer, fluid movement and other physical properties on CAD and CAM systems
• Modeling software
• Next-generation simulation toolkit

Phase of Development - Concept

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Inventors

Kumar Tamma, PhD
Professor, Mechanical Engineering

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