Fractional-order Software for Multiphysics Calculations

A new computational platform enables more accurate modeling and optimization of engineering and multiphysics processes by solving fractional-order equations.

Computational platforms that simulate engineering and multiphysics processes use integer-order equations for calculations, and cannot solve for processes governed by fractional-order equations. Researchers at Purdue University have developed a computational platform that solves fractional-order equations, allowing for the modeling of many physical processes of interest including wave propagation, heat transfer, and vibrations. Applications for the computational platform include in simulating physical processes and optimizing systems.

Advantages:

-More accurate simulation of physical processes than integer-order calculations

-Ability to perform calculations on wider range of processes

Potential Applications:

-Simulations and modeling

-Optimization of processes and systems

-Design of devices

TRL: 3

Intellectual Property:

Keywords: Computational platform, fractional-order equations, multiphysics processes, engineering simulation, wave propagation modeling, heat

Technology ID
2019-SEMP-68501

Category
Robotics & Automation/Simulation, Digital Twins, & Industrial Automation

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transfer, vibrations analysis, system optimization, device design, accurate physical process simulation