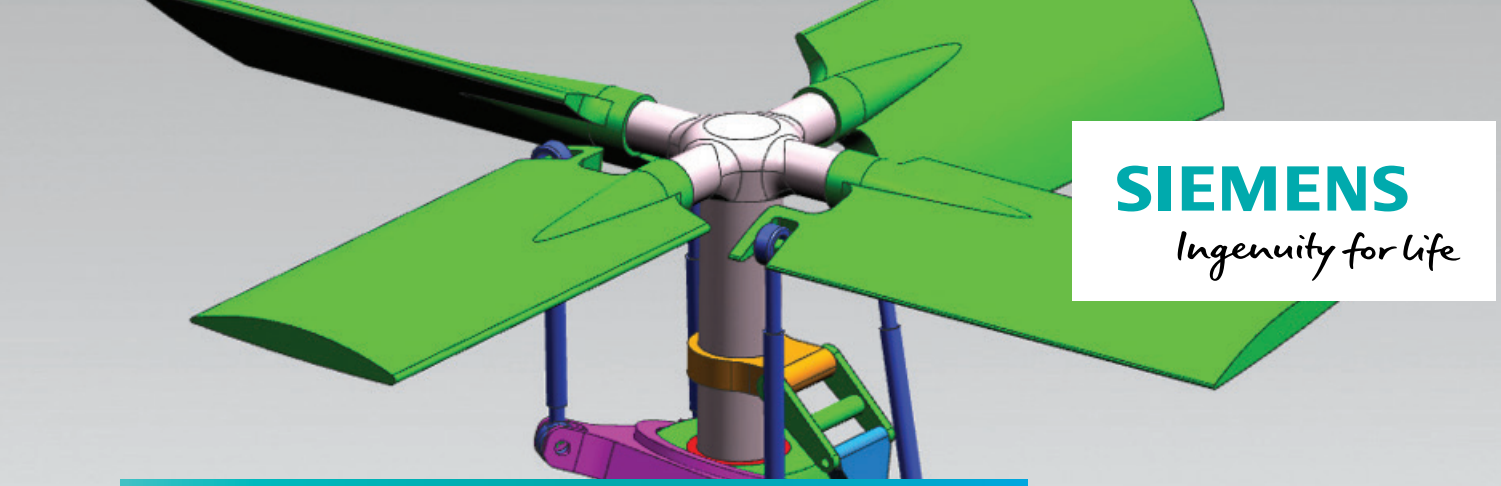

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Simcenter 3D Motion Solver

Simulating complex motion behavior

Benefits

- Reduce costly physical prototypes by using motion simulation to understand mechanism performance
- High accuracy of calculations (displacements, velocities, acceleration, reaction forces, flexible body results) through advanced multibody dynamics solving techniques
- Expandable options to simulate flexible bodies and integrate control systems to simulate mechatronics systems

Summary

Simcenter 3D Motion Solver software helps engineers predict and understand the functional behavior of parts and assemblies. It delivers a complete and very robust set of capabilities to support all aspects of advanced dynamic, static and kinematics motion simulation.

The Simcenter 3D Motion Solver is built on more than 30 years of proven solver technology and uses the most advanced numerical multibody solving techniques to guarantee a fast, stable and robust simulation. Additionally, it provides accurate results for reaction forces, displacement, velocities, and accelerations for rigid bodies. The loads obtained from the simulation can also be applied for structural analysis and durability, noise and vibration studies.

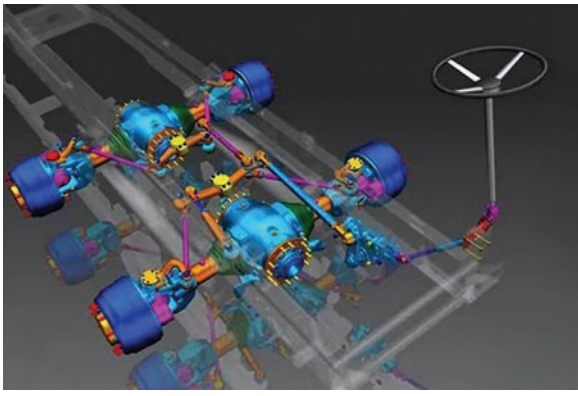
Simcenter 3D Motion Solver is used for a variety of applications and industries, such as sunroof, chassis or powertrain mechanisms in the auto industry, landing gear or wing flap mechanisms in aerospace, or printers and drive systems of electronic systems.

Analysis types

Simcenter 3D Motion Solver is the base application for performing rigid body multibody dynamics analysis.

Simcenter 3D Motion solver uses an efficient set of sparse matrix algorithms to solve the linear equations formed in each type of analysis. The types of analysis supported in Simcenter 3D Motion Solver include:

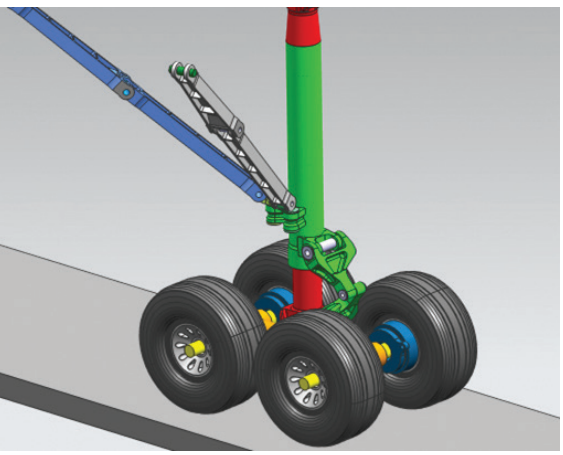
- Kinematic
- Dynamic
- Static
- Time and step
- Articulation – quasi-static or kinematics, interactively driven
- Spreadsheet – quasi-static or kinematics, driven via a live Excel table



Simcenter 3D Motion Solver

Modeling environment
To create models for Simcenter 3D Motion Solver, you can use the Simcenter 3D Motion Modeling module. Simcenter 3D Motion Modeling provides all of the multibody pre- and postprocessing capabilities engineers need to create and run models in the Simcenter 3D Motion Solver. Simcenter 3D Motion Modeling uses real geometry data and allows you to quickly convert a complete CAD assembly into a motion model in seconds. Additionally, the motion models you build in Simcenter 3D Motion Modeling are associated to the base design data. This means if the original CAD geometry changes in the assembly, you can rapidly update the corresponding motion model to incorporate the new geometry.

Part of the Simcenter 3D platform
Simcenter 3D Motion Solver and Simcenter 3D Motion Modeling are part of the broader Simcenter 3D platform for 3D simulation. For certain types of structural, acoustics, vibration and durability analysis, it is critical to understand the loading conditions for the part or assembly being analyzed. Simcenter 3D Motion Solver can help you determine these loads and seamlessly transfer the loading conditions to the Simcenter 3D Engineering Desktop for use in other simulation applications. This can help greatly improve productivity for you or your extended simulation team.



Extend motion capabilities
The Simcenter 3D product suite includes add-on modules that let you extend motion simulation beyond rigid body dynamics. The following modules are available:

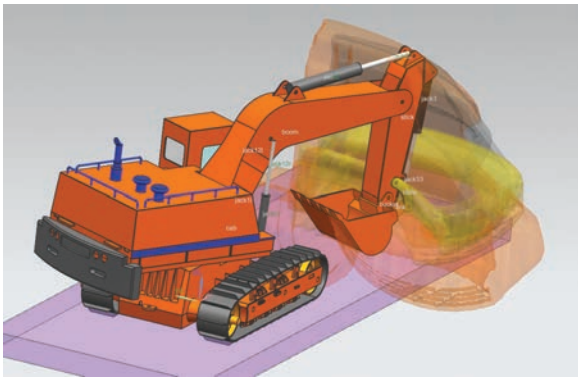
Simcenter 3D Motion Flexible Body
Increase the accuracy of multibody models by considering component deformations during motion simulation of mechanisms through integration of a finite element analysis (FEA) model.

Simcenter 3D Motion Control
Simulate mechatronic systems by linking control systems and actuators developed in MATLAB®/Simulink® and LMS Imagine.Lab™ software. This enables you to co-simulate your control systems simultaneously with your mechanism simulation to better understand how those systems interact.

Simcenter 3D Motion tire modules
Accurately predict tire-road interactions for CAE-based driving dynamics assessment for passenger car, motorcycle, truck and aircraft landing gear tires. Simcenter 3D offers the following tire models through these modules:

- Simcenter 3D Motion Standard Tire
- Simcenter 3D Motion CD Tire
- Simcenter 3D Motion MF Tyre
- Simcenter 3D Motion MF Swift Tyre

Supported hardware and operating systems
Simcenter 3D Motion Solver is a module in the suite of Simcenter 3D applications. In order to build a motion model, you must also have a license of Simcenter 3D Motion Modeling. Unequal numbers of licenses of the solver and Simcenter 3D Motion Modeling products are permitted. It is available on all Simcenter 3D supported hardware/OS platforms (Windows and Linux).



Siemens PLM Software
www.siemens.com/plm

Americas +1 314 264 8499
Europe +44 (0) 1276 413200
Asia-Pacific +852 2230 3308

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