

EFFICIENT VEHICLE DYNAMICS BEHAVIOR

Multibody Simulation Solutions for Fast and Accurate Vehicle Dynamics Assessments



DELIVERING SAFE, RELIABLE VEHICLE PERFORMANCE THROUGH ADVANCED SIMULATION

Customers expect a safe, reliable, and high-quality driving experience when purchasing vehicles, characterized by good handling and a smooth ride. Original Equipment Manufacturers (OEMs) face the challenge of meeting these demands while simultaneously reducing costs and increasing durability. At SIMULIA, we provide both standalone and design-integrated multibody simulation solutions, including Simpack and the Suspension Analyst Role on the 3DEXPERIENCE® platform. These tools address a wide range of challenges in vehicle dynamics applications. The Suspension Analyst Role offers a unified Modeling and Simulation (MODSIM) environment that breaks down silos between design and analysis, facilitating rapid product development and quicker time-to-market. Our enterprise-level solutions, including Simpack Wizard and our industry-proven multibody solver technology, enable users to accurately analyze and validate vehicle dynamic performance.

CHALLENGE

Robust & accurate MBD simulations

Extreme load events or large-scale DOE simulations of complex models demand solver stability and high numerical accuracy

Real-time simulation capability

Software-in-the-Loop (SiL), Hardware-in-the-Loop (HiL), Driver-in-the-Loop (DiL) applications require accurate and reliable real-time simulations with easy interfaces to hardware for objective and subjective evaluations of vehicle performance

SOLUTION BENEFITS

- Industry-proven Simpack solver enables extreme load event simulations without tuning solver settings
- Proven accuracy even for higher frequency applications such as gearbox noise and vibrations
- Fast KPI assessments ensure projectable result availability
- Unique Simpack Realtime solver allows detailed high-fidelity models to be simulated in real-time without simplifications
- User-friendly interfaces allow on-the-fly model parameter changes on the simulators without time-consuming validation steps
- Reduced time and cost through minimized prototypes/ testing and accelerated KPI assessments

CHALLENGE	SOLUTION BENEFITS
Simulation data management Multiple models for various vehicle dynamics applications result in redundant data and tedious model conversion processes	- Enterprise solution offers one user-friendly model database suitable for all vehicle dynamics applications - Organized structure for model and simulation data storage within a single environment - Cost savings from tool landscape reduction and elimination of model conversion processes
Automation of Simulation Processes Large-scale DOEs, or multiple variant simulations, necessitate the evaluation and comparison of multiple product KPIs	- Enterprise solution offers one user-friendly model database suitable for all vehicle dynamics applications - Organized structure for model and simulation data storage within a single environment - Cost savings from tool landscape reduction and elimination of model conversion processes
Sequential Development Processes Siloed design and analysis processes, data transfer between various departments results in long design iteration loops and significant delays in product development, particularly when there are changes in requirements	Unified MODELing and SIMulation (MODSIM) approach on the 3DEXPERIENCE platform enables fast design iterations - Automated modeling allows designers to take advantage of the power of simulation in the early stages of development - Single source of truth enables seamless collaboration between all stakeholders of the product development cycle - Reliable simulation processes and results with minimum manual effort

Predicting vehicle dynamics behavior virtually is crucial for accelerating development, achieving cost savings, and providing the high-quality driving experience customers expect.

Why Choose SIMULIA?

- Robust, efficient, and accurate multibody dynamics solver
- Unmatched real-time simulation capabilities
- Unique flexible body integration technology
- Intelligent automation through advanced scripting capabilities
- The **3DEXPERIENCE** platform enables fast, efficient, and concurrent engineering

Find out about [Simpack](#), and join the SIMULIA Community to learn more about [Multibody System Dynamics & Motion Simulation](#).

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for Real Life**

