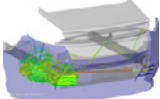
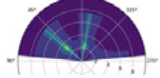


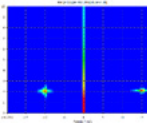
ADVANCED DRIVER-ASSISTANCE SYSTEM (ADAS)

SIMULIA Electromagnetic Solutions for Fast and Accurate Simulation Results



Modern vehicles rely on advanced driver assistance systems (ADAS) to deliver safety and reliability in real-world traffic scenarios. Electromagnetic simulation makes it possible to assess sensor placement, array design, and the effects of multipath and nonlinear motion from vehicle structures such as bumpers. SIMULIA provides advanced radar simulation capabilities through **CST Studio Suite®**, combining full-wave solvers, asymptotic methods, and multiphysics workflows. This integrated approach helps engineers predict, analyze, and optimize ADAS radar performance in complex vehicle scenarios and V2X environments.

CHALLENGE	SOLUTION BENEFITS
 Radar Sensor Design Designing radar modules for integration into complex vehicle geometry requires accurate electromagnetic modeling to ensure reliable sensing in real-world V2X environments.	• Asymptotic solver using SBR ray-tracing with GPU acceleration for large-scale vehicle modeling. • Specialized conformal meshing technologies for accurate simulation of curved, multilayered geometries.
 Bumper Effects Bumper structures can distort radar signals, introduce reflections, or block detection altogether.	• Channel Impulse Response (CIR) simulations to detect multipath and bumper-induced signal distortion. • 3DEXPERIENCE® platform integrates CAD and simulation for streamlined sensor design and optimization. • FIT/TLM solvers with GPU acceleration for full-vehicle electromagnetic analysis.
 Angle of Arrival (AoA) Poor MIMO array design reduces AoA accuracy and compromises ADAS and V2X perception.	• Multi-target AoA extraction using CST Studio Suite® MIMO simulation with dedicated Python toolkit. • KPI maps reveal angular resolution and ghost suppression for V2X radar optimization.

CHALLENGE	SOLUTION BENEFITS
 Range-Doppler Map ADAS systems require precise detection of target distance and velocity in complex driving scenes with multipath and nonlinear motion.	• Postprocessing templates extract Doppler velocity versus range from FMCW radar waveforms. • Simulates realistic motion patterns including sinusoidal target trajectories and bumper interference.

Addressing ADAS radar challenges early in the design cycle helps meet safety requirements, reduce costly redesigns, and deliver reliable perception under real-world driving conditions. With GPU-accelerated solvers, specialized meshing, and integrated workflows, **SIMULIA** empowers engineers to design and validate ADAS systems with confidence.

Why Choose SIMULIA?

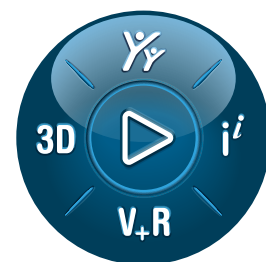
- CST Studio Suite technology
- Hybrid solvers integrating full-wave and asymptotic methods
- GPU-accelerated performance for large-scale vehicle modeling
- Robust conformal meshing
- Integrated multiphysics capabilities
- Seamless integration of CAD models
- **3DEXPERIENCE** platform

Find out about [CST Studio Suite](#), and join the SIMULIA Community to learn more about [ADAS](#).

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