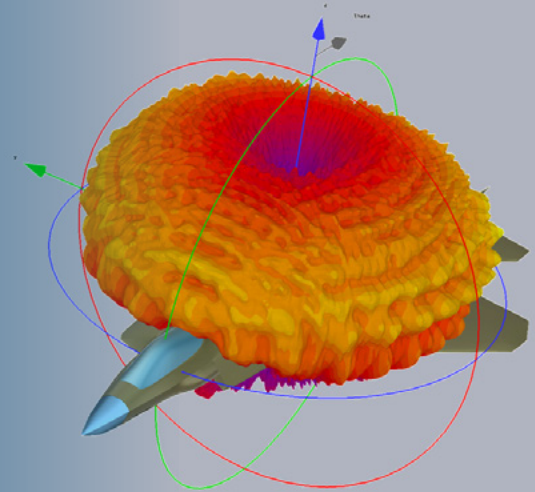


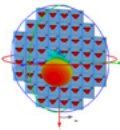
COMMUNICATION, NAVIGATION & DETECTION SYSTEMS DEVELOPMENT

SIMULIA Electromagnetic Solutions for
Fast and Accurate Simulation Results



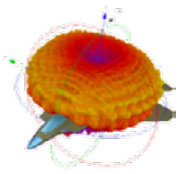
SIMULIA delivers end-to-end electromagnetic (EM) and multiphysics solutions for next-generation communication, navigation and detection systems across aerospace and defense platforms. Engineers can address key electromagnetic challenges across components, materials and system integration with IP security early in the development cycle.

CST Studio Suite®, integrated with the 3DEXPERIENCE® platform and complemented by tools such as Antenna Magus, WASP-NET®, FEST3D, Spark3D, and IVCAD, enables engineers to model antennas, RF components, radomes, and stealth materials with high precision. This integration enhances the accuracy of system-level predictions, shortens prototype development cycles, and facilitates secure collaboration between OEMs and suppliers.

CHALLENGE	SOLUTION BENEFITS
 Antenna Design High-performance antennas in aerospace and defense systems must meet strict electromagnetic requirements while integrating into the limited space on airborne and spaceborne platforms.	• Antenna Magus and WASP-NET accelerate antenna design for aerospace and defense platforms, cutting rework. • CST Studio Suite full-wave solvers validate integrated antennas pre-hardware, reducing test, certification risk and cost • Array tools in CST Studio Suite optimize multifunction AESA layouts within existing apertures.
 Radomes & Stealth Materials Radomes and stealth materials must preserve antenna performance while reducing platform signature across wide operating bands in aerospace and defense applications.	• Specialized solvers model metamaterials, RAM and structures at full-aircraft scale for RF-signature balance. • Hybrid solvers predict radome impact on the full aircraft, avoiding late redesigns. • Fast unit-cell simulation speeds up metamaterial design and characterization, lowering technical and program risk.

CHALLENGE

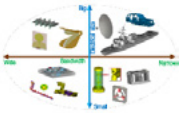
SOLUTION BENEFITS



Antenna Placement

Poor antenna placement and integration can significantly degrade RF performance and increase interference, putting mission-critical communication, navigation and detection at risk on aerospace and defense platforms.

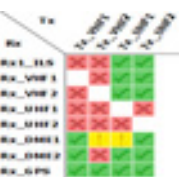
- GPU-accelerated transient and MLFMM solvers enable fast, accurate full-airframe placement studies.
- Antenna Placement App guides optimal locations in CAD, aligning RF, fluids and structures teams.
- Placement optimization workflows considers aerodynamic, structural and acoustic impact for better performance trade-offs.



Multiscale Electromagnetic Modeling

Accurate modeling of broadband coupling from components to full platforms across multiple orders of magnitude in scale demands extreme numerical accuracy, as small errors can grow into large system-level deviations.

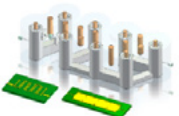
- Multi-hybrid FIT/TLM/FEM/MoM/Asymptotic solvers with GPU covers wide physics and frequency ranges in one environment.
- Scalable solvers span components to full aircraft, ensuring a coherent EM prediction system-wide.
- **3DEXPERIENCE** platform can reduce CAD cleanup and conformal meshing for complex structures ultimately decreasing the model-preparation time



Co-Site Interference Mitigation

Close placement of antennas and radios increases the risk of severe co-site interference, threatening reliable communication, navigation and sensing in mission-critical scenarios.

- Accurate near- and far-field modeling reveals realistic co-site interference between antennas and radios.
- Full-aircraft coupling simulations reveal interference issues before tests, reducing cost and delays.
- User-friendly workflows streamline interference diagnosis and mitigation for faster decisions.



Microwave and RF Component Design

On advanced aerospace and defense platforms, RF and microwave components must remain efficient and stable across harsh mechanical, thermal and radiation environments—any drift in performance directly threatens mission-critical communication and detection.

- Filter Designer 3D and FEST3D synthesize and optimize filters for high-performance RF hardware.
- Spark3D predicts high-power multipactor and corona breakdown, protecting hardware and mission availability.
- IVCAD enables repeatable PA measurement and modeling, improving efficiency, linearity, and reliability.
- WASP-NET accelerates full-wave RF component and antenna-array optimization with hybrid multi-solver technology.

High-fidelity EM simulation enables aerospace and defense teams to de-risk integration before hardware, achieve system-level performance in contested environments and significantly reduce costly late-stage redesign.

Why Choose SIMULIA?

- **Electromagnetic Excellence:** CST Studio Suite delivers proven EM solvers with conformal meshing, GPU acceleration and integrated multiphysics.
- **Unified Portfolio:** A complementary suite of tools - including CST Studio Suite, Antenna Magus, WASP-NET, FEST3D, Spark3D and IVCAD—covers a full spectrum of electromagnetic simulation.
- **Integrated Platform:** Tight connection to the **3DEXPERIENCE** platform links EM analysis with CAD, systems engineering and virtual twin workflows.
- **Guided Workflows:** Seamless CAD integration and dedicated applications, such as the Antenna Placement App cut setup time and standardize best practices across teams.

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

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With Dassault Systèmes' **3DEXPERIENCE** platform, 370,000 customers of all sizes, in all industries, can collaborate, imagine and create sustainable innovations that drive meaningful impact.

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for Real Life**

