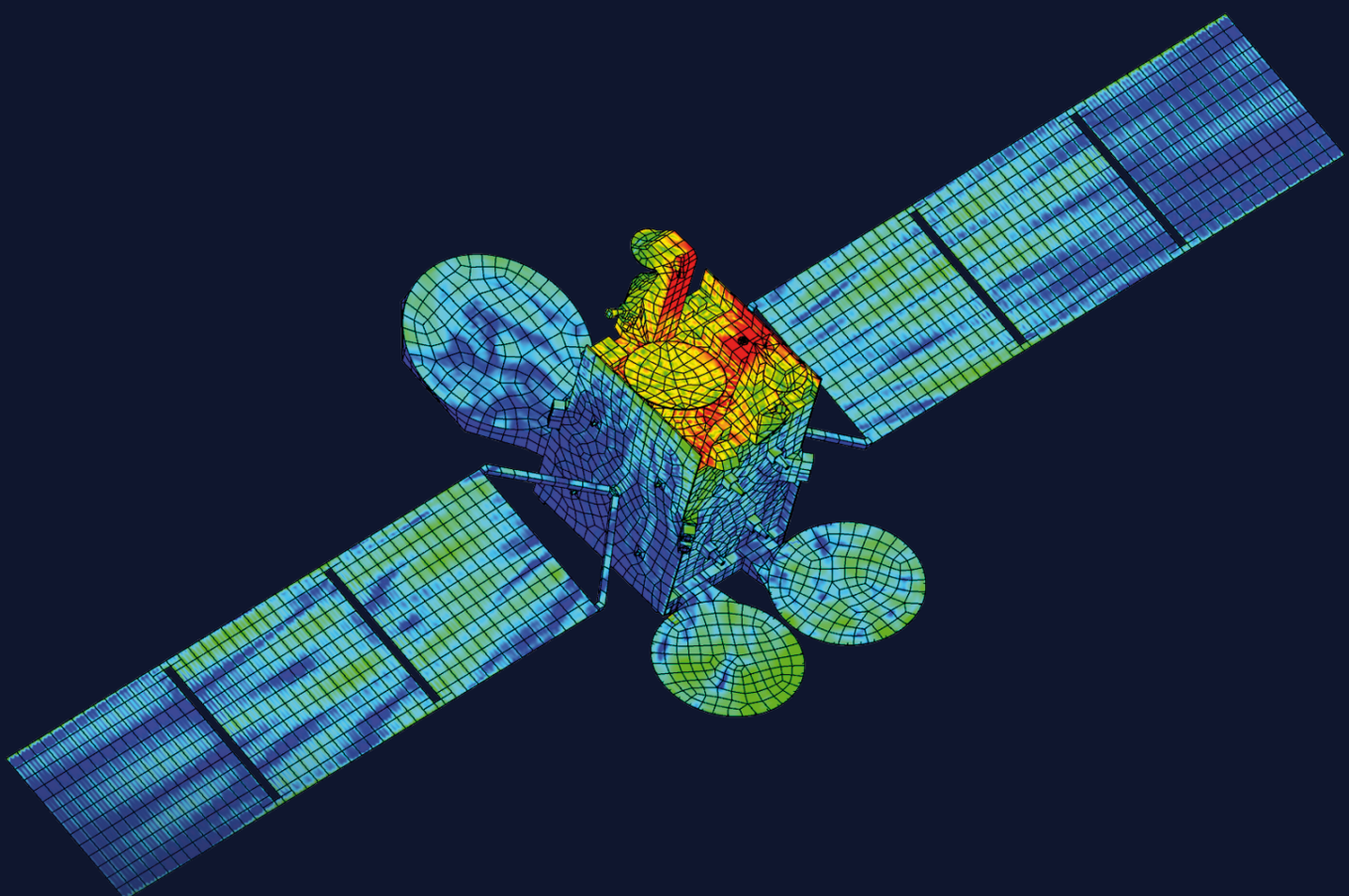
TICRA

ESTEAM

Full-wave scattering and installed-performance analysis for complex antenna systems - radar cross section, platform integration and antenna placement in one solution.



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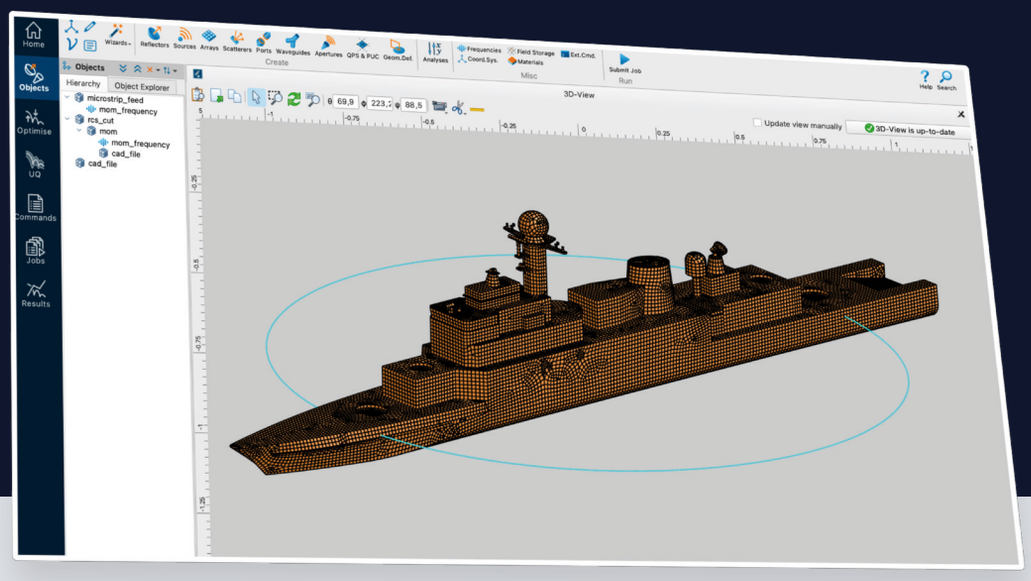
Antenna, feed and platform - modelled as one system in ESTEAM



Design and validate installed antenna performance with confidence

Real-world antennas rarely operate in isolation. They are mounted on satellites, aircraft, ships, vehicles and other platforms - close to other antennas, payload and structural components that can distort their radiation pattern, shift their pointing, or scatter energy back in unwanted directions.

Predicting true installed performance means modelling the antenna and its surroundings together, rather than the antenna alone.

ESTEAM is TICRA's dedicated software for electromagnetic scattering and radiation analysis tailored for engineers who need to understand how the antenna, the feed and its platform behave as a unified system, and who need to optimise performance down to the last fraction of a dB.

ESTEAM supports the entire design workflow: build or import your CAD model, mesh it automatically, and solve with a tailored higher-order MoM engine accelerated by MLFMM - enabling full-wave analysis of electrically large, complex structures, from a single reflector and its support arm to space-borne payloads, aircraft or naval vessels.

RCS, platform integration and antenna placement - one solution

PRODUCT CAPABILITIES

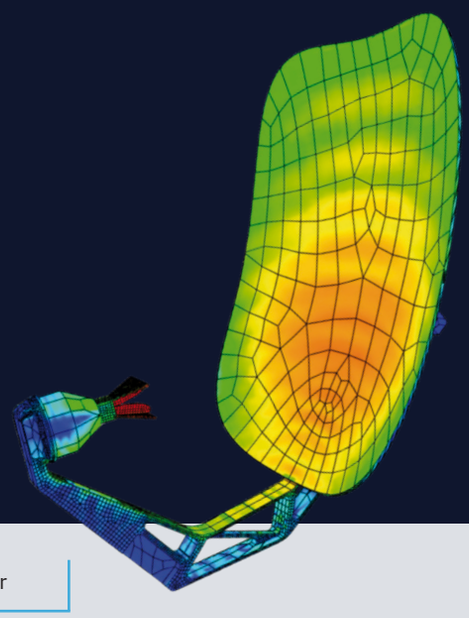
- Place your antenna to minimise interference from surrounding structures and the platform
- See how platform components - masts, panels, payload - affect antenna pattern, gain and pointing
- Co-design antenna and platform in one full-wave model, rather than designing the antenna in isolation
- Calculate monostatic RCS of an object across aspect angles to identify detection hotspots
- Assess how materials - conducting, dielectric, magnetic - affect RCS and scattering
- Model realistic feed hardware to catch cross-pol and pattern distortions before you build

KEY TECHNICAL HIGHLIGHTS

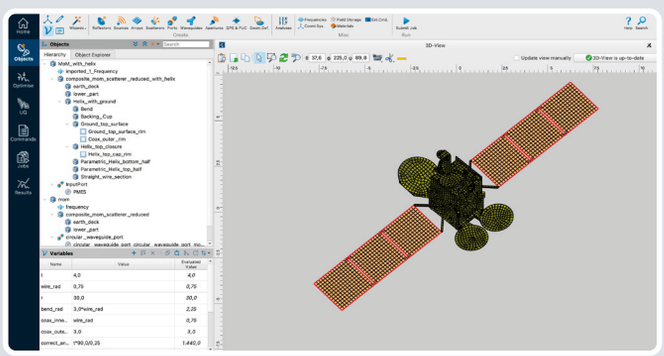
- Higher accuracy and lower memory usage than competing software - specialised higher-order MoM solver with performance-optimised MLFMM
- An integrated CAD editor that allows you to build and modify your antenna system directly in TICRA Tools
- Import CAD (STEP/IGES) and mesh files, with automatic meshing
- Built-in library of parameterised objects: Combine wires, boxes, and bodies of revolution to build complex structures quickly
- Realistic feed modelling: Built-in waveguide ports, generators and import of measured patterns as excitations

Why ESTEAM and TICRA?

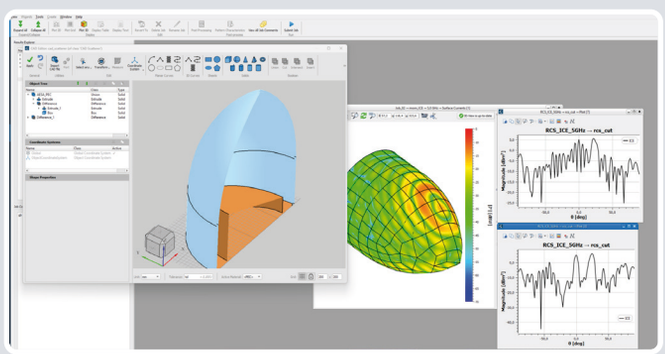
Since 1971, TICRA has worked with customers, research institutions and industry partners across space, defence and telecommunications to develop electromagnetic software for complex antenna applications where accuracy and reliability are essential - a heritage that still shapes TICRA Tools today, combining scientific expertise, specialised methods and practical engineering workflows in one consistent framework.



Reflector antenna and feed assembly analysed for platform-installed performance.



Satellite platform with solar panels and helix antenna, meshed and solved in ESTEAM. Analysis time **7:12 hrs**, memory **380 GB.**



Radome built in the CAD editor, with monostatic RCS cuts and surface currents. Analysis time **3 hrs**, memory **3 GB.**

Technical highlights

RCS PREDICTION

- Monostatic Radar Cross Section
- Visualise RCS detection hotspots
- Design and investigate Radar Absorbing Materials
- Design and investigate the effect of radomes

PLATFORM & INSTALLATION

- Design, analysis and validation of complex antenna installations
- Analysis and optimisation of antenna placement
- Platform-component effects (masts, panels, payload)
- Realistic feed modelling

MODELLING & WORKFLOW

- Higher-order MoM with tailored MLFMM
- Integrated CAD editor
- CAD import (STEP/IGES) with automated meshing
- Seamless TICRA Tools integration

Integration with TICRA Tools

ESTEAM works seamlessly with the rest of TICRA Tools and can be combined with GRASP for reflector-antenna design, ARRAY for phased-array design and optimisation, and CHAMP 3D for the feed chain - all in one shared modelling environment.

Build or edit platform and antenna geometry directly with the integrated CAD editor, or import CAD (STEP/IGES) and mesh files. The same model moves straight from GRASP or ARRAY into ESTEAM for installed-performance and scattering analysis, and back again - no re-modelling, no file conversion.

Get in touch

Advance your installed-performance and RCS analysis capabilities. See how ESTEAM can help you model, analyse and design your antenna, feed and platform as one unified system with confidence before you build.

Request a demo or discuss your application with a TICRA engineer.

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