

Space Systems Engineering and Operations Projects in 3D with STK Software

AGI Supports Dutch National Aerospace Laboratory

ADVANCED IMAGING: The Dutch National Aerospace Laboratory (NLR) has been using AGI products for several years in its aerospace-related projects. In these, STK runs in parallel with in-house developed engineering tools.

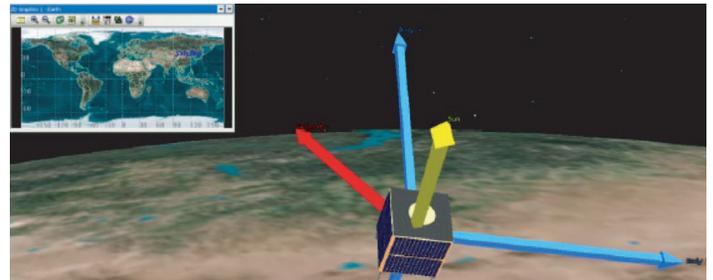
At NLR, EuroSim is used for real-time simulations of attitude-control scenarios. EuroSim is a configurable simulator tool used to support all phases of space and non-space programs through real-time simulations with a person and/or hardware-in-the-loop, and allows re-use of existing model software where available.

THE THREE-DIMENSIONAL VIEW: STK provides 3D visualization of Simulator Model Portability-based simulator models for a future Electrical Ground Support Equipment (EGSE) system. The EGSE system will support attitude-control hardware-in-the-loop testing activities.

Within the EuroSim environment, STK mission imagery is commanded by EuroSim scripts. Satellite position and attitude data calculated by the simulator are sent to STK to visualize a 3D satellite model orbiting the Earth in real-time. Thereby, additional visualization features such as vectors and transformation systems are easily included.

“By integrating STK with our in-house developed engineering tools we are able to address challenging topics.”

— ARNAUD VAN KLEEF, R&D ENGINEER, NLR
AEROSPACE SYSTEMS DIVISION



3D visualization in STK for EuroSim

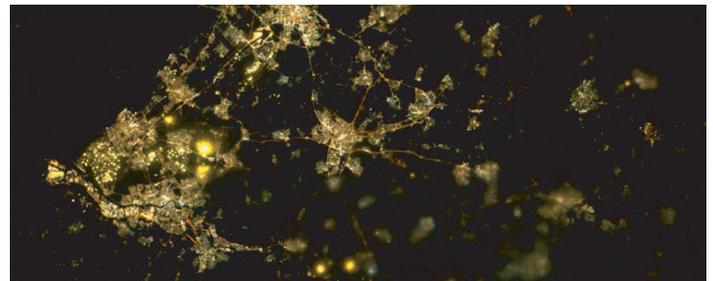


Photo of the Netherlands taken by ESA astronaut André Kuipers from the ISS with NightPod. The largest cities of the Netherlands are clearly visible: Amsterdam, Utrecht, Rotterdam and The Hague. visibility coverage analysis for ground-based objects (e.g. cities) from the ISS
Credit: ESA/NASA



NLR needed 3D visualizations with in-house real-time attitude control simulator architecture. For missions aboard the International Space Station, they also needed coverage analysis for daily ground observations.

STK IN ACTION: Beyond space system engineering-related projects, STK also supports manned-spaceflight operations and planning for NLR's User Support & Operations Centre (USOC) activities aboard the International Space Station (ISS). For ESA's PromISse mission, STK provided visibility coverage analysis for ground-based objects. Cameras mounted on NightPod track the movement of Earth as it travels under the Space Station and allow precise photography of interesting targets.

AGI delivers mission-proven software for timely and cost-effective development and deployment of advanced space, defense and intelligence applications. AGI products are used for modeling, engineering and operations in the areas of space, cyberspace, aircraft, missile defense, C4ISR and electronic systems. They can be purchased as ready-to-use applications, development tools or turnkey solutions.