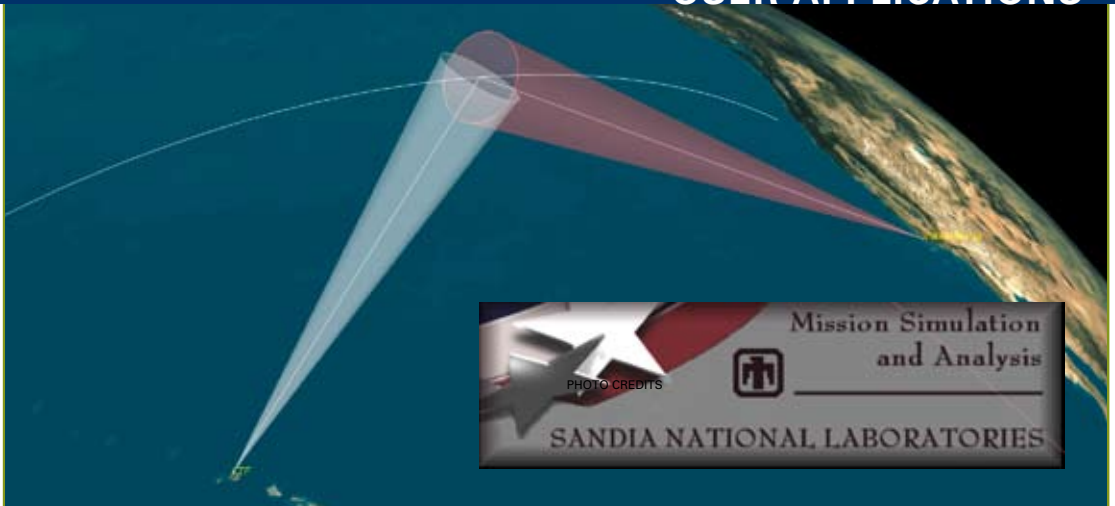


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# COMM Link Analysis

STK Enables Sandia to Analyze Deployed Objects for NMD

Ground receiving stations at Kauai Test Facility and Vandenberg Air Force Base track objects in flight.

FOR COMMUNICATIONS LINK ANALYST MARK PLATZBECKER, who works at Sandia National Laboratories, Albuquerque, NM, using STK ended the hassle of developing software code and let him focus on the task at hand: National Missile Defense (NMD) testing.

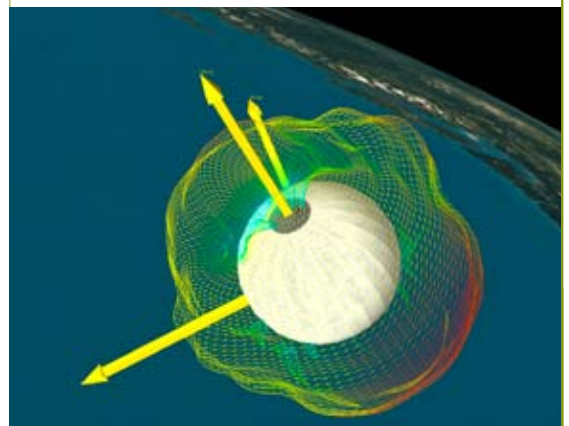
Platzbecker and his co-workers in the telemetry technology development department at Sandia use STK for communications link analysis of deployed objects during NMD intercept flight tests. By combining simulated data with postflight data, they accurately generate the ephemeris and attitude files required to define objects within STK. They then use the STK/Communications module to develop, analyze, and display results of all flight objects within the scenario. This approach creates a high-fidelity communications analysis, which assists engineers in the design and evaluation of complex telemetry systems. Although the project on which Platzbecker is working has not yet flown, the results from the STK link analysis simulations have been instrumental in helping him understand what could cause potential link failures during actual testing.

Previously, the group used a commercial simulation and visualization program that required knowledge of software programming language and took extensive code development and software maintenance. The visualization code was not coupled with the department's communications link analysis capabilities, and to integrate both was expensive. STK, a commercial off-the-shelf (COTS) product that does not require a great deal of programming, put an end to coding and enabled the Sandia engineers to focus on link analysis.

STK provides analysts a fuller picture of communications link capabilities during the entire trajectory of an object. According to Platzbecker, past communications link budget analysis was done using a complex Microsoft® Excel spreadsheet. While accurate, it was limited to ana-

lyzing a single area in the trajectory of a missile or other object, and used a representative antenna configuration. Using STK's 3-D visualization component and STK/Communications, the analysts were able to take into account communications link quality during the entire trajectory as well as the actual antenna orientation of the object. They can also pause the simulation at any point during the object's flight and tie the link analysis results with STK's numerous visual cues. "STK lets me input actual antenna pattern data from range testing, by far the most accurate way to analyze link parameters between flight objects and ground receiving assets," Platzbecker says.

So, by removing excess coding and by providing a fuller picture of the communications link, STK helps Mark Platzbecker and fellow Sandia analysts do their jobs more efficiently. ▲



FM antenna pattern is modeled around a deployed test object.