

SECTOR:  
AEROSPACE SYSTEMS

OFFERINGS:  
CUSTOM ENGINEERING  
SOFTWARE

TECHNOLOGY:  
ELECTROMAGNETICS AND  
SOFTWARE DEVELOPMENT

## PARALLELIZATION OF STEALTH SOFTWARE FOR FULL AIRCRAFT RCS PREDICTION

Our customer is the lead agency responsible for design and development of fifth generation stealth multi role fighter aircraft. The aircraft needs to incorporate design-based stealth features such as optimized airframe shaping and edge matching. For assisting design process, the agency plans to employ its proprietary RCS prediction code based on PTD method. However, this code was written a decade ago and suffered from issues like non-intuitive user input method, very large run time for big aircraft geometries and absence of RCS specific post processing module

Zeus Numerix transformed the customer's code into a user-friendly GUI driven software package. The original serial code was parallelized using hybrid techniques of OpenMP and MPI and was configured to run on remote computing cluster and retrieve results from it. A custom post processor was developed to analyze RCS specific output like hot spot visualization of surface currents, 2-D polar plots, range profile, circular polarization, etc.

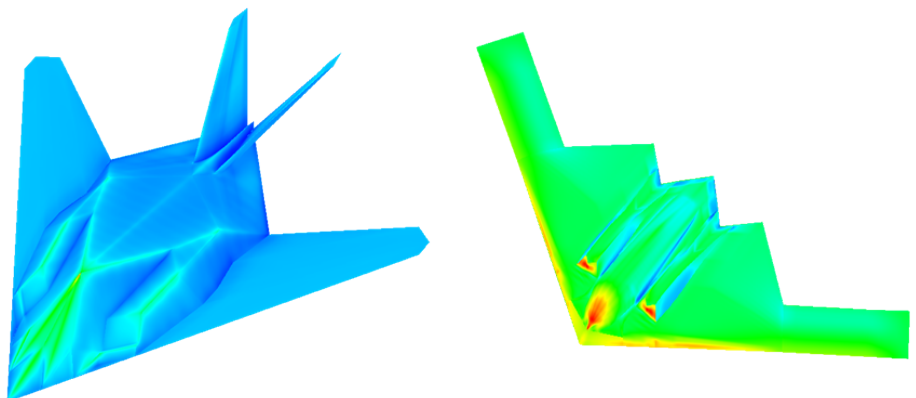


Figure 11: Representative surface current plots on the fighter aircraft geometries

Customer was provided the improved RCS software package along with documentation like technical reference guide and user manual. Due to parallelization of code, the run time for aircraft RCS prediction came down from 8 hours to just 20 minutes. An intuitive user interface meant that many persons in agency were able to use the software effectively.