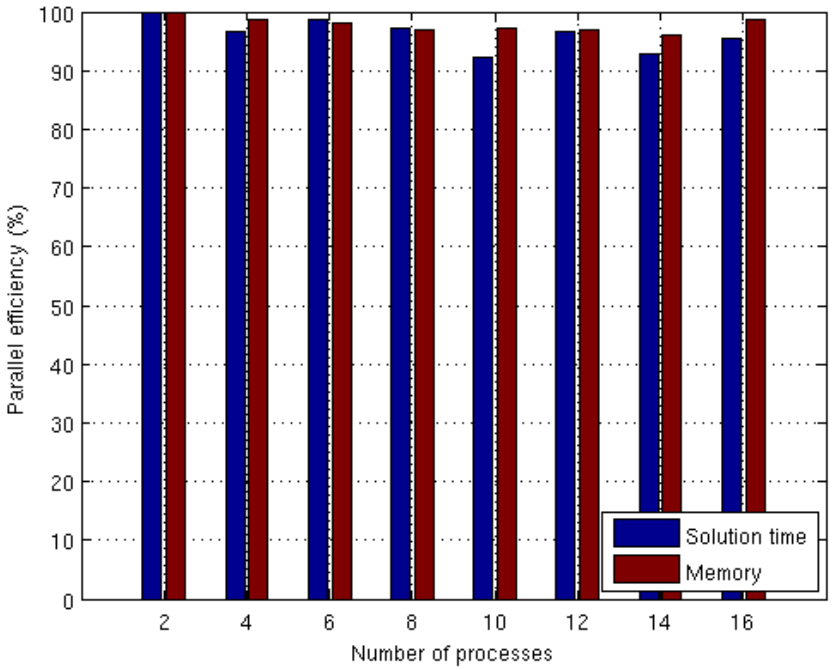
Performance and Scalability

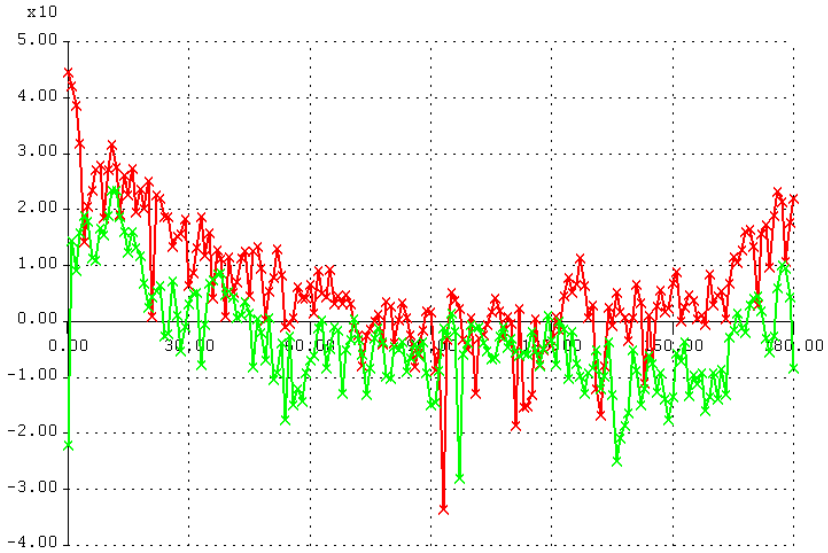
- The Efield 6.0 FDTD solver introduces a number of improvements for high-performance computing
- Fully MPI parallelized and scalable implementations of all modules, including:
  - Absorbing boundary conditions, PML
  - Plane wave excitation
  - Near- to far-field transformation
  - Surface currents
  - Thin sheets and IBC
  - Probe and power surfaces
- Efficient meshing of FDTD domains consisting of tens of billions of cells
- Near optimal parallel efficiency in both simulation time and memory use (~95%) .
- Proven performance for realistic test cases including RCS computation of aircraft and array antenna analysis
- Validated for problem sizes larger than 10 billion cells



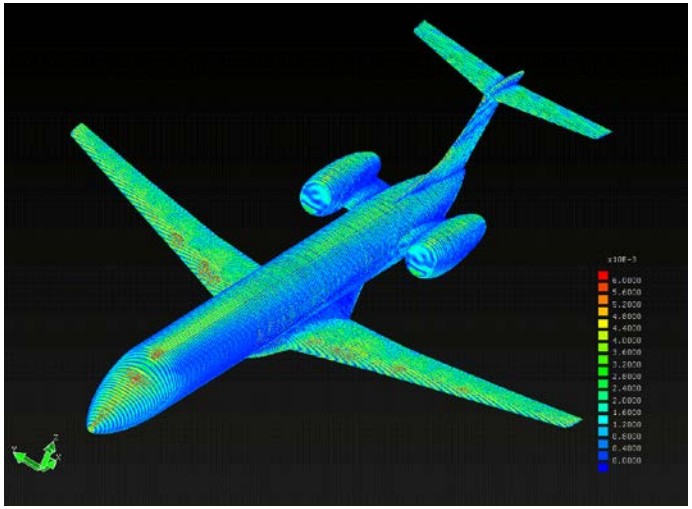
Parallel efficiency for the Embraer 145 RCS test case for different number of nodes on a distributed cluster

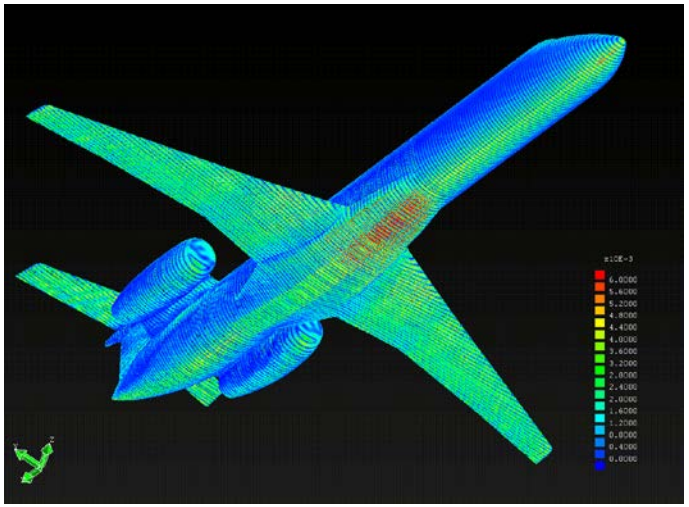
Example:Embraer 145

- Platform dimensions: l=30m w=20, h=5m
- Efield FDTD bistatic RCS computation
- Plane wave excitation, q=90, j=180
- 1.4 billion cells (2082x1482x449)
- Memory use: 70GB
- Total simulation time: 5 hours



Bistatic RCS at 1GHz, qq- (red) and qj-polarization, q=90, j=0:180,





Surface currents at 1GHz