THIRD WAVE SYSTEMS
MODELING TECHNOLOGY · MACHINING SOLUTIONS

VERIFICATION OF ADVANTEDGE

Mesh Adaption

AdvantEdge is based on the Lagrangian finite element formulation, which relies on continuous mesh adaption to improve the quality of the finite element mesh to maintain the accuracy and speed of a simulation. Recent performance improvements in the computation core allow AdvantEdge 3D to solve larger and more complex simulations. In complex simulations, adaption becomes more common highlighting some critical issues affecting efficiency, robustness and parallel scalability.

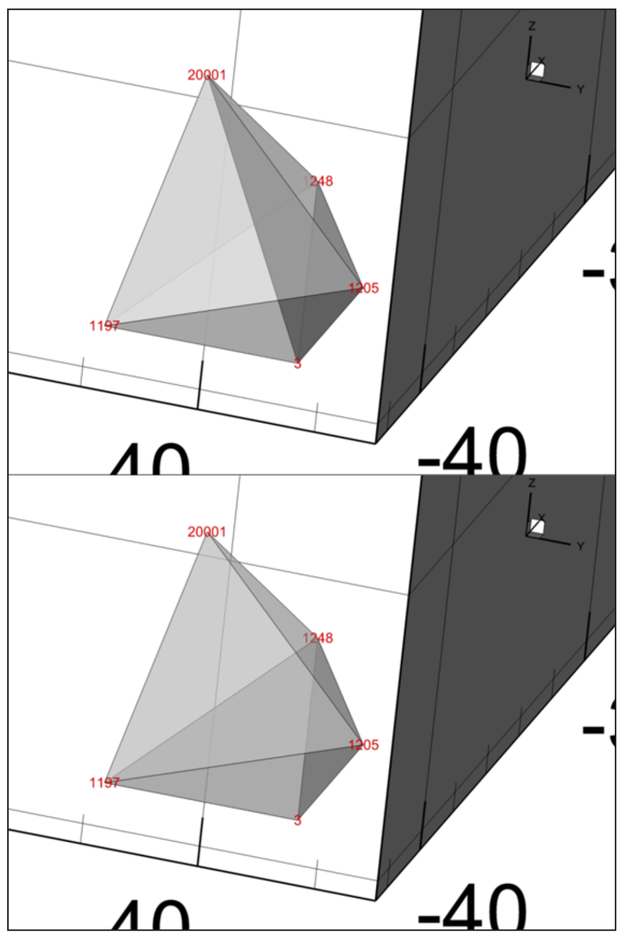
COMPLEXITY & APPROACH

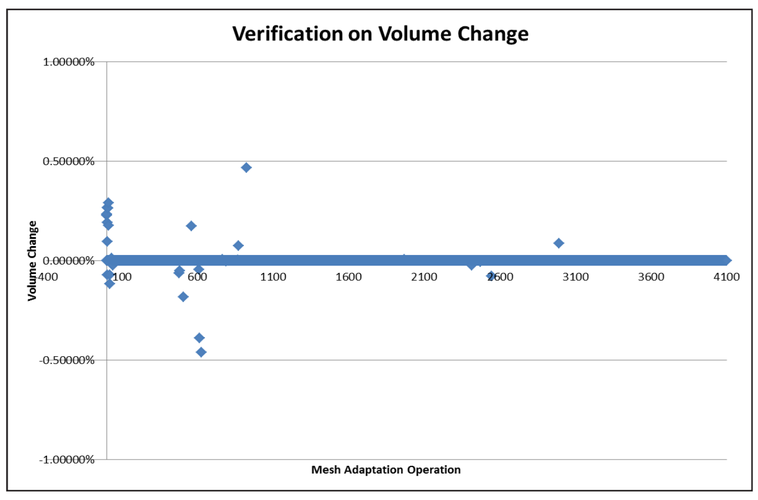
Layered Verification
- » Fundamental operators
- » Strategies
- » Parallel implementation

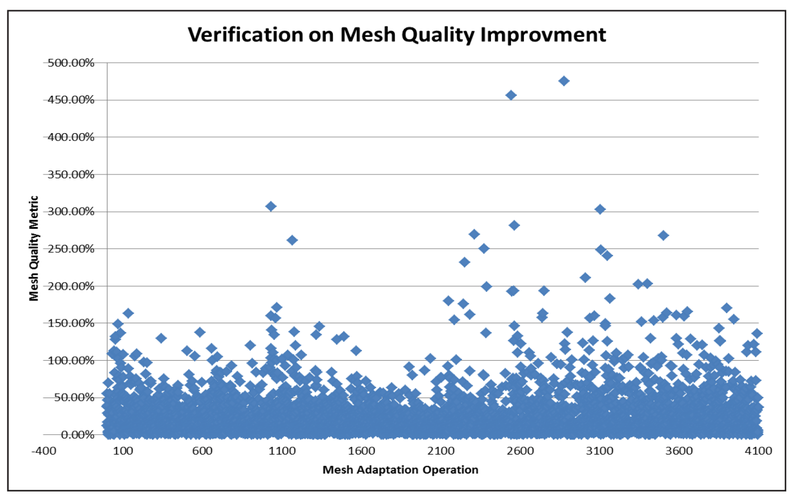
Monitor Metrics On
- » Quality
- » Effectiveness
- » Correctness
- » Robustness

VERIFICATION EXAMPLE

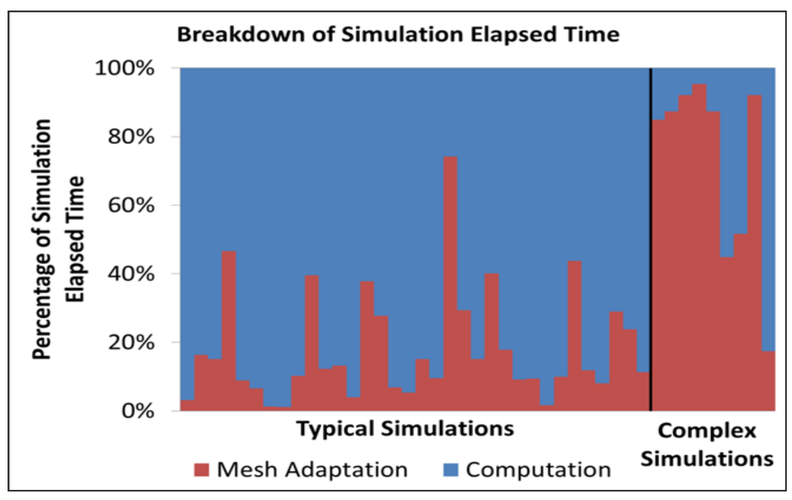
The results from a standard battery simulation show that with 4,100 mesh adaption operations, the volume change is less than 0.5% while the mesh quality consistently improves.







A positive value indicates improvement in the mesh quality



Verification Document

Verification testing is central to ensuring accurate results, but customer data used throughout restricts sharing this material. To facilitate this communication, last year Third Wave Systems released a generic verification document for 3D materials using a simple compression test.

For the version 7.2 release, the 3D test was updated and a 2D compression test was added. Additional verification testing will be added to the document for future releases including contact and adaption.