

Omega_h Parallel Unstructured Mesh Adaptation on GPUs

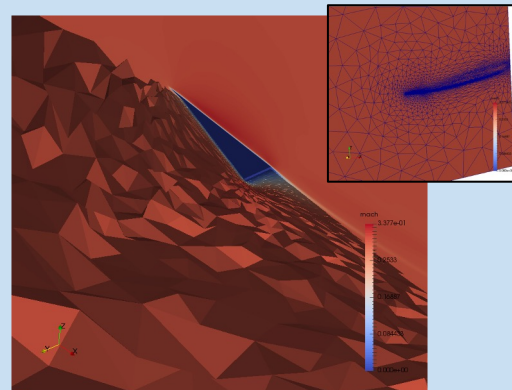
Parallel adaptation of unstructured meshes on GPUs. Support the development of unstructured mesh simulation workflows on leadership systems.

Core functionality

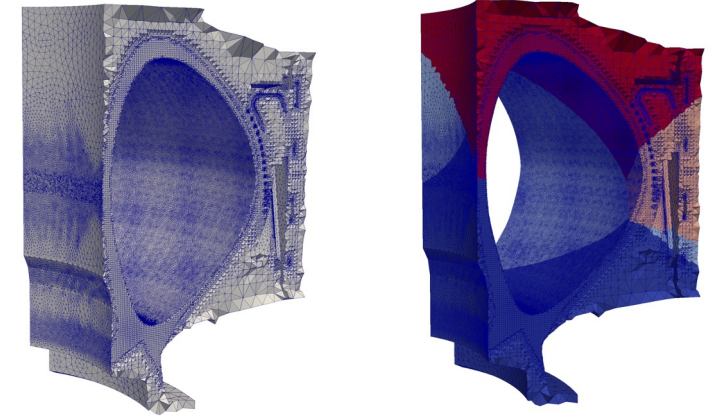
- Distributed, conformant mesh adaptation (coarsening past initial mesh + refinement)
- Manycore and GPU parallelism using Kokkos
- Runs on NVIDIA, AMD, and Intel GPUs
- Supports complex geometric models via Gmsh and Simmetrix SimModSuite

Applications Supported

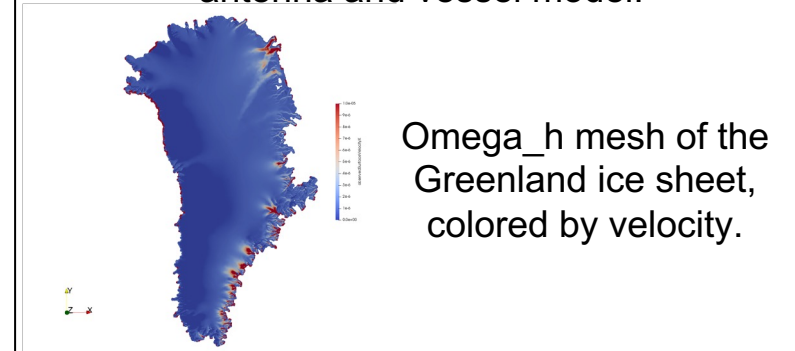
- GITRm: impurity transport
- XGCm: core+edge fusion plasma physics
- MFEM: finite element framework specializing in high-order methods
- PetraM: RF Fusion
- MALI: land ice melting



'Crinkle clip' view of wing's top surface after adaptation (main) and wake on symmetry surface (inset).



Serial and RIB partitioned mesh of RF antenna and vessel model.



Omega_h mesh of the Greenland ice sheet, colored by velocity.



Source Code: github.com/SCOREC/omega_h
Thesis: scorec.rpi.edu/REPORTS/2016-25.pdf