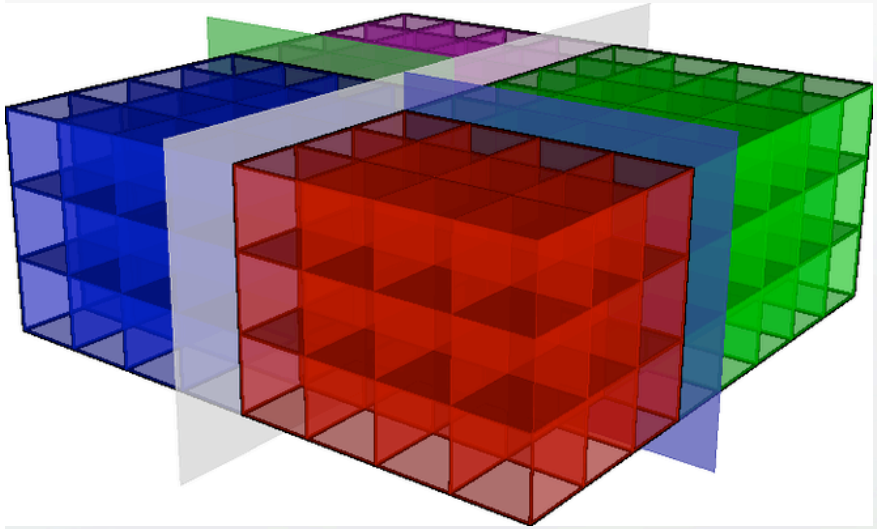
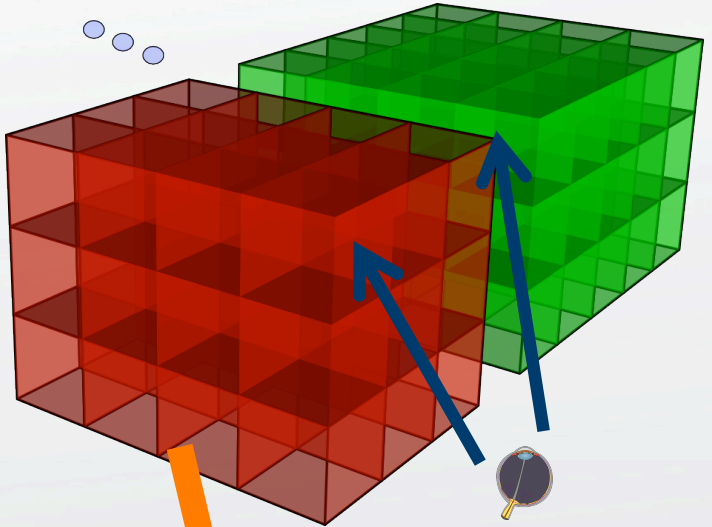
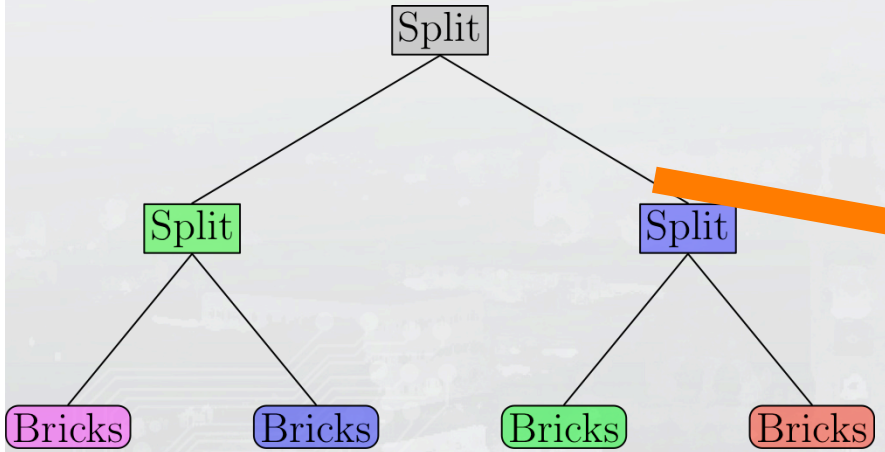
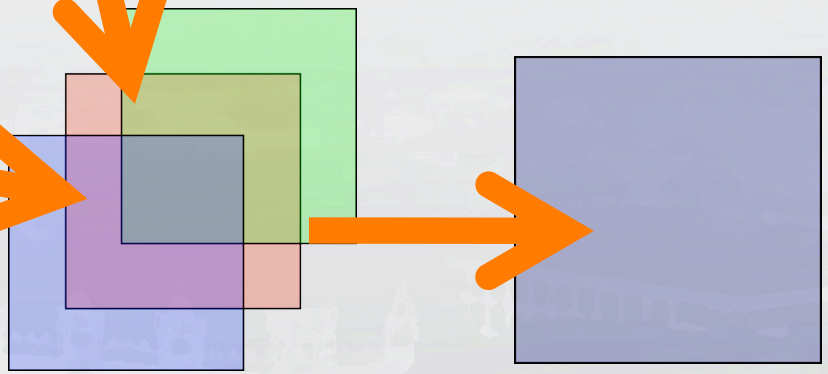
Parallel Volume Rendering



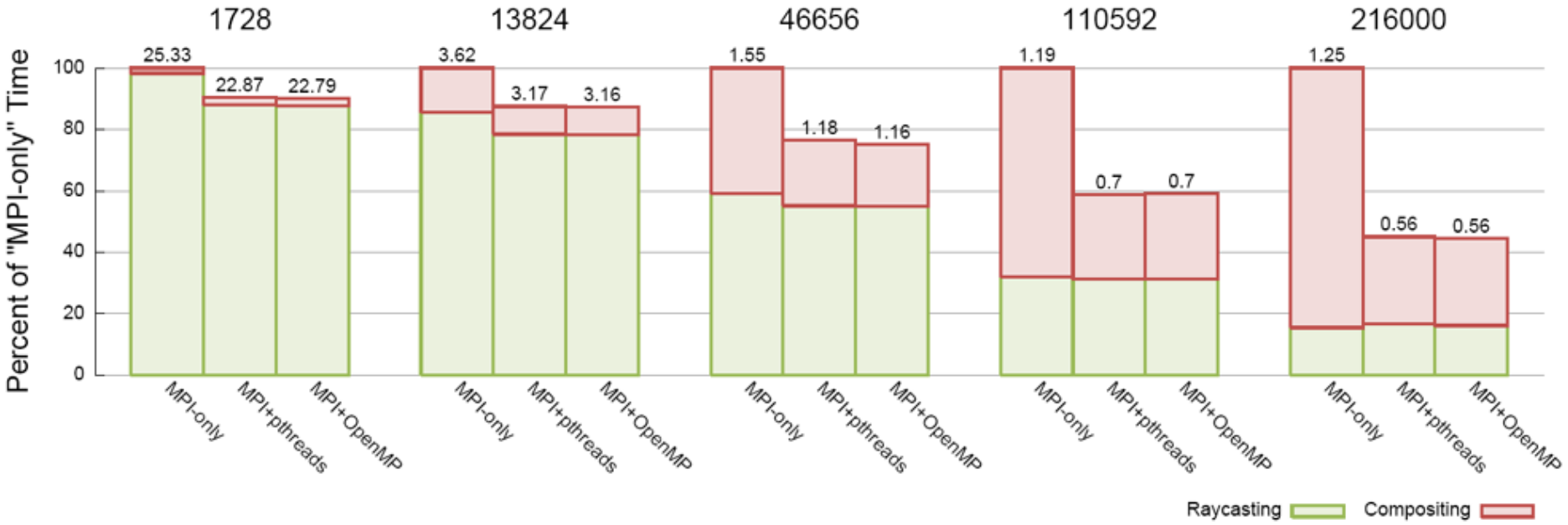






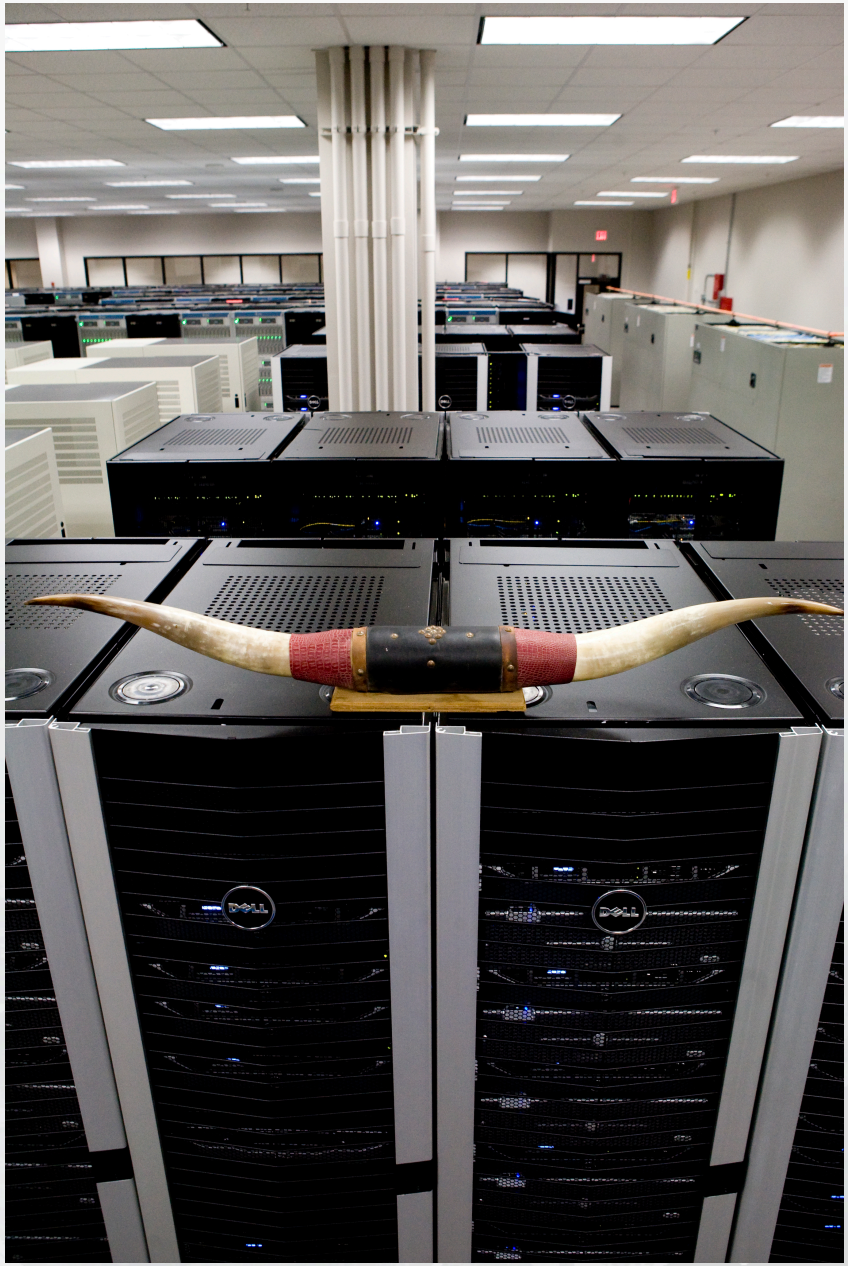
Volume Rendering Scalability

- Need lots of cores to render at acceptable speeds

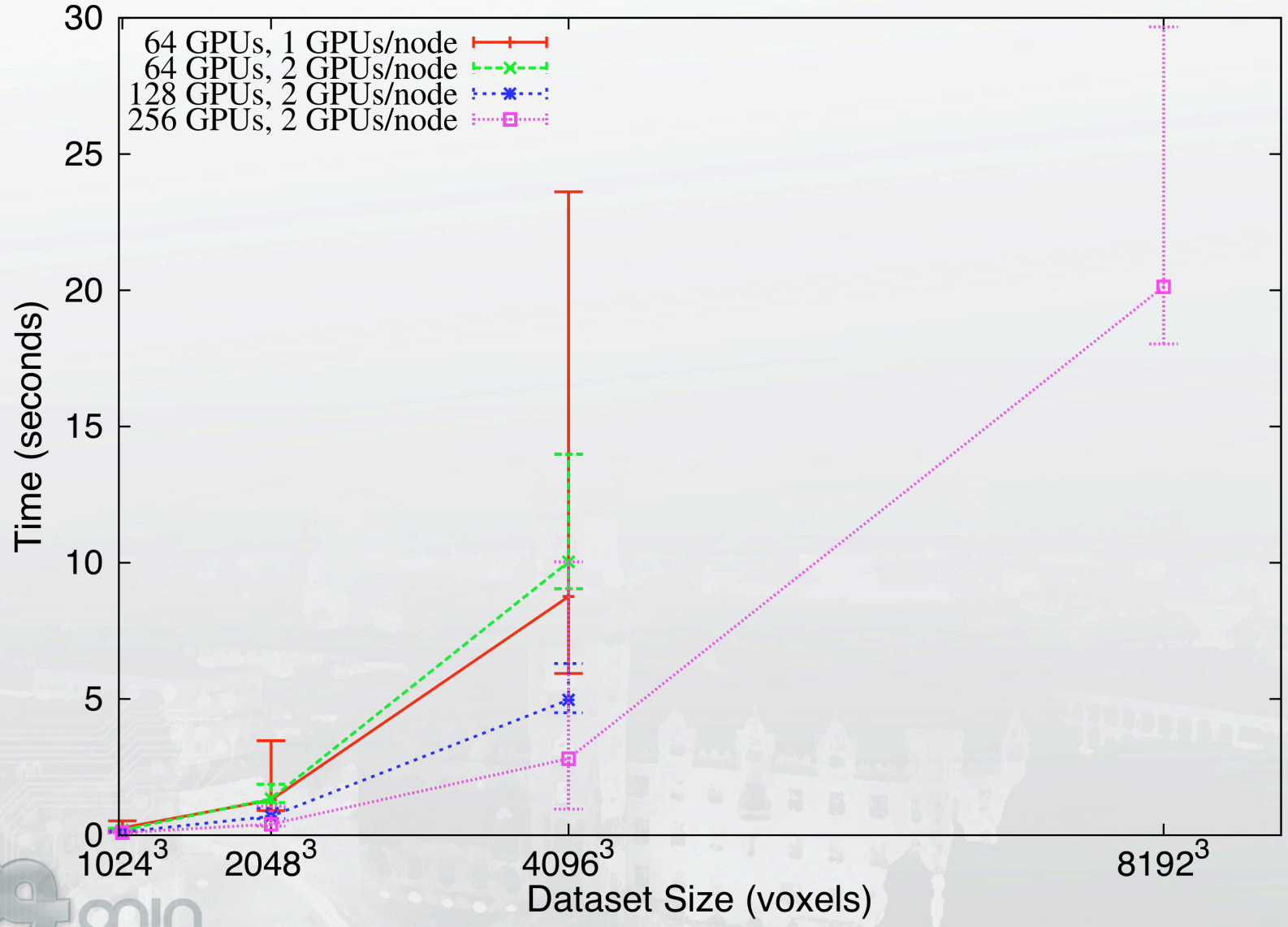


- Figure: Howison, Bethel, Childs, *MPI-hybrid Parallelism for Volume Rendering on Large, Multi-core Systems*, EGPGV 2010

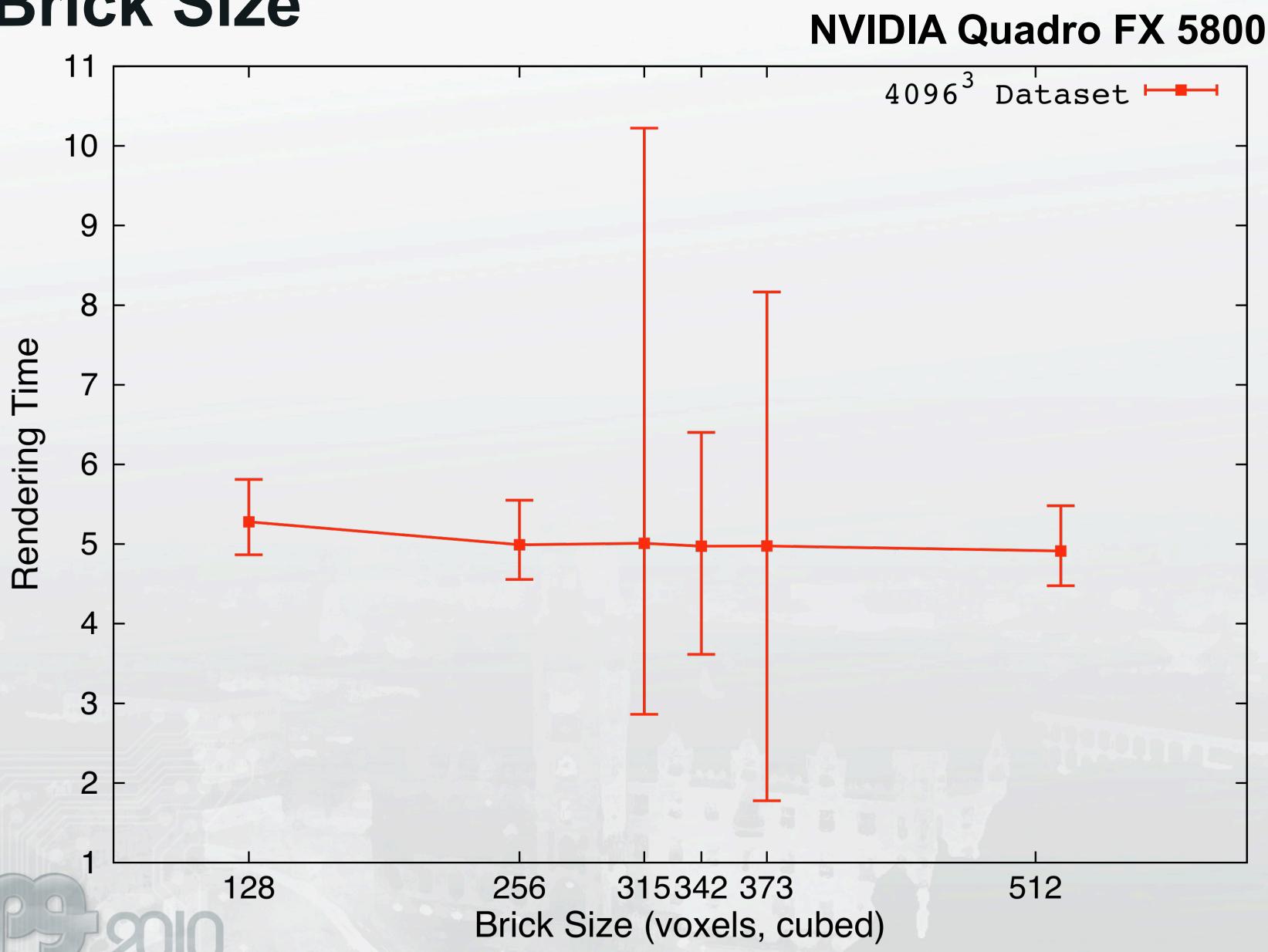
Longhorn



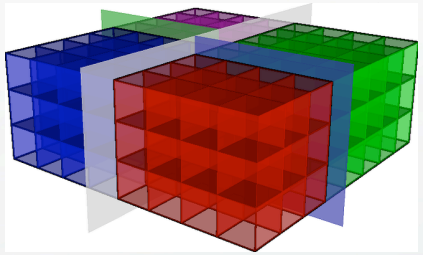
Performance

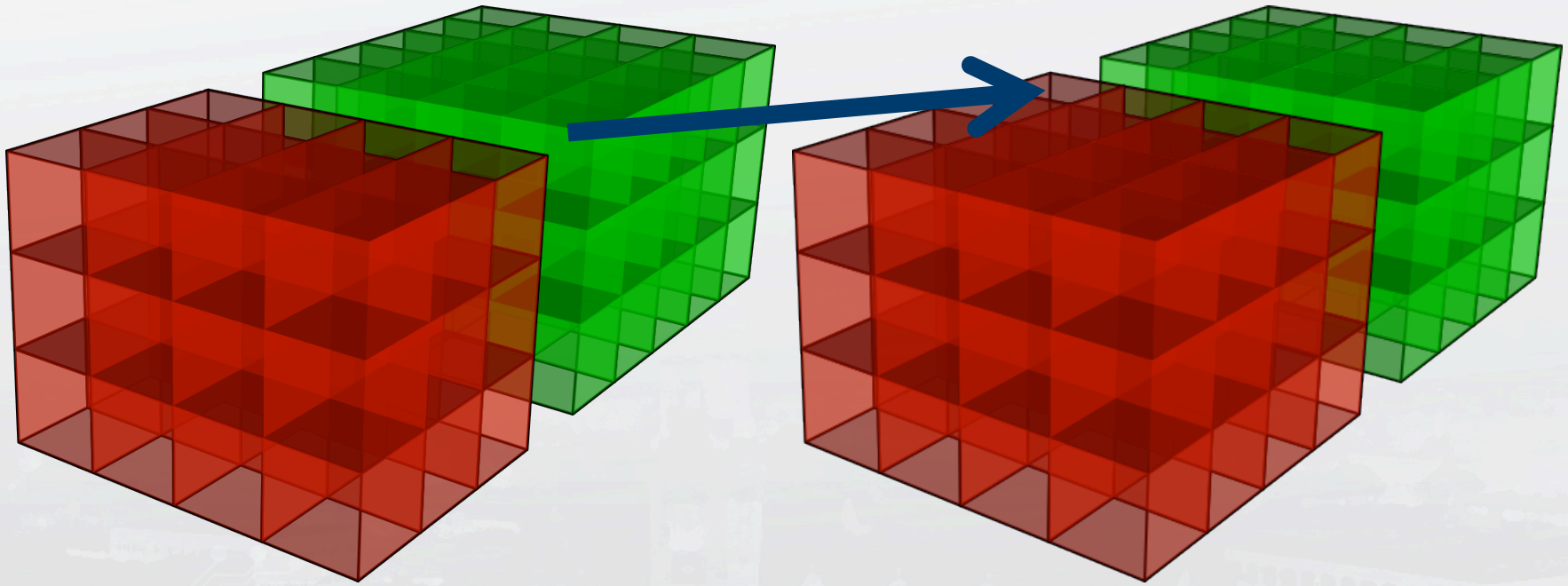


Brick Size

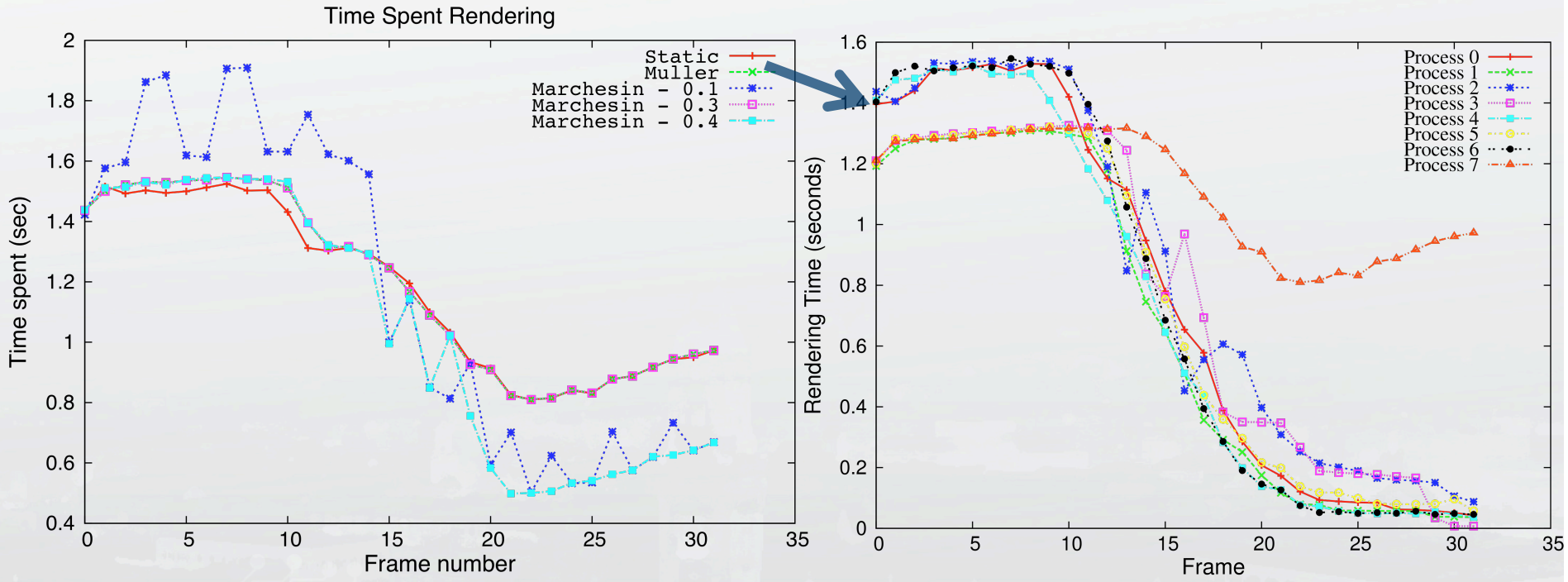


Dynamic Load Balancing



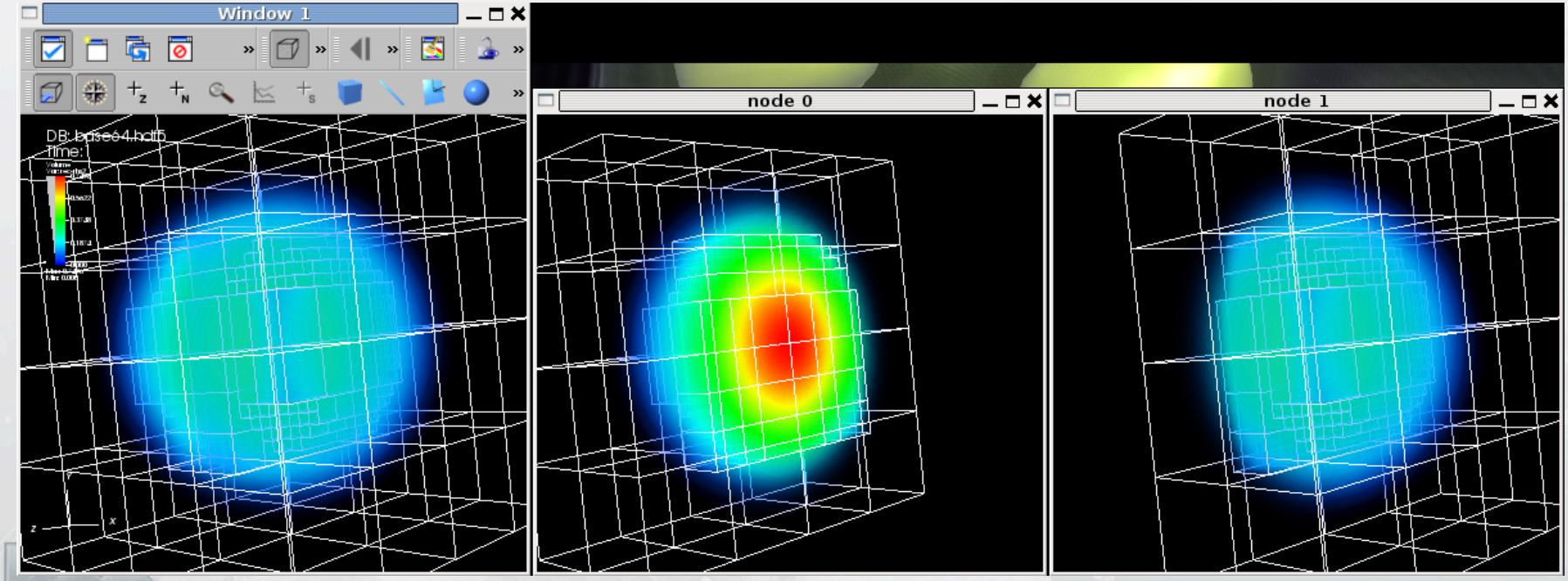


Load Balancing



Future Work - AMR

- "Adaptive mesh refinement" data
  - some spatial regions have higher-resolution
  - coarse/fine boundaries: sampling
  - uneven load distribution



Thanks

- Funding
  - VACET
  - CIBC
  - C-SAFE
  - MMCI (Saarland University)
- Resources
  - TACC
  - ORNL
- Open source communities: GLEW, Mesa, VisIt
- Anonymous reviewers
- You!

Questions?