

○ > 18 / 08 / 2016

Next level of GeantV Parallelization

CERN openlab Summer Students
Lightning Talks Sessions

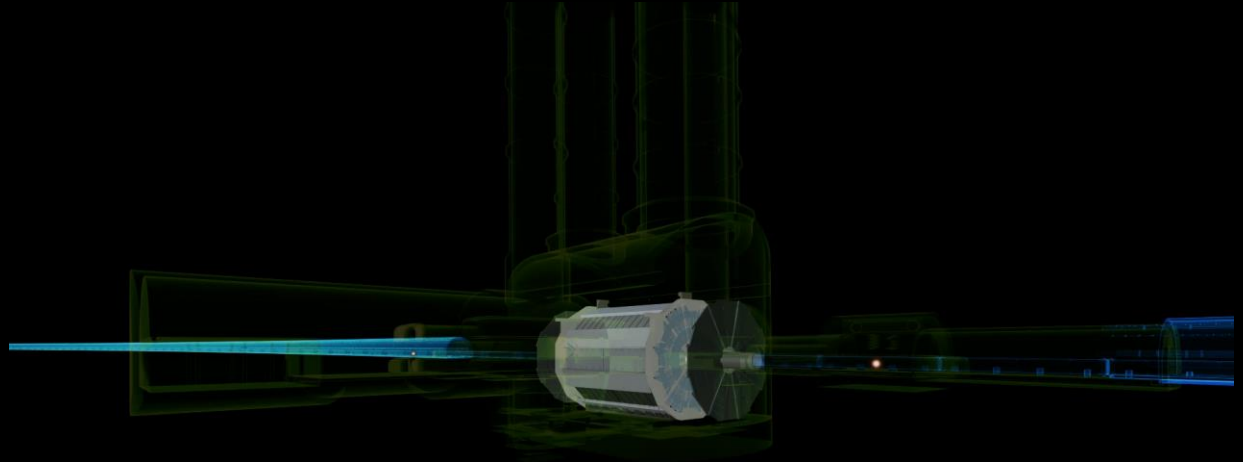
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The project: Geant family

› Simulation of collision



The project: GeantV

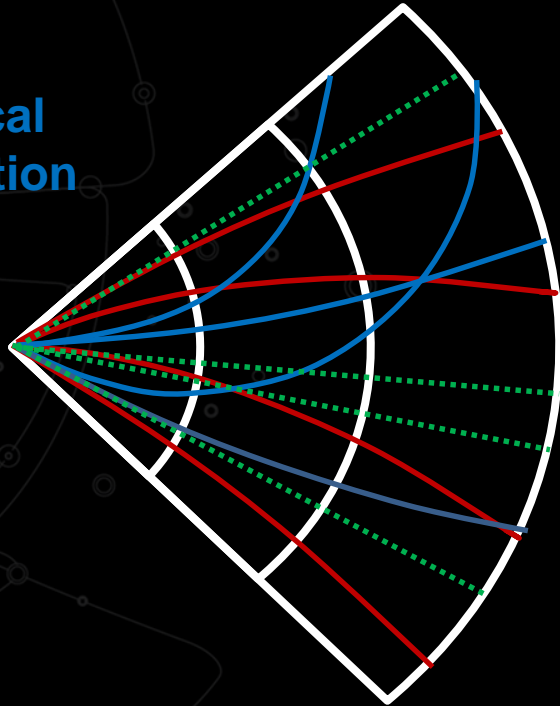
> Simulation of collision

- Vectorized version
- Multithreading

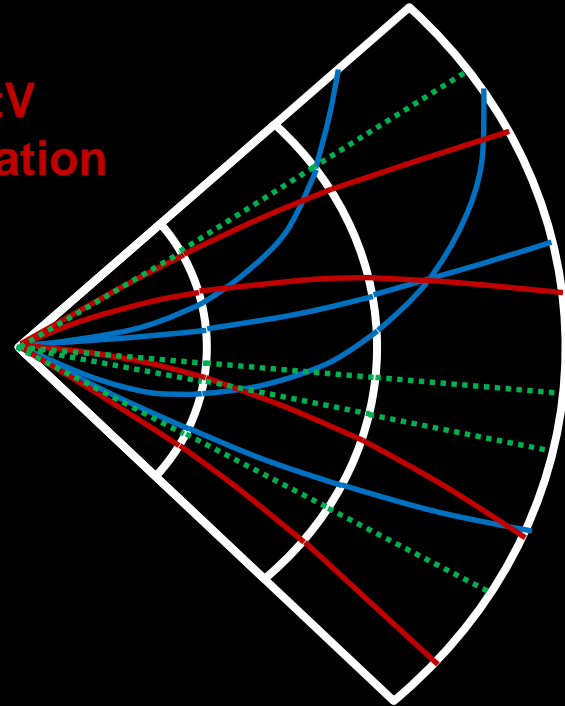


The project: GeantV

Classical
simulation



GeantV
simulation



The Challenge

> Begin

- Vectorization
 - Core level
- Thread parallelization
 - Socket level

> Issues

- Scalability ~12 Thread
- NUMA communication
 - Between Sockets

My Solution

› Replicate the computation part

- → Multi-process
- → Shared memory

› Issues and New Challenge

- Singleton
- Thread-safe
- Initialization steps
- ...

The Project Impact

- › ~ Infinite scalability
- › Code consolidation
- › First step for multi-computer scaling

- › **Suggestion:**
 - Stop to overgeneralize code
 - specifically if the implementation is different
 - Choose and design all parallelization before start coding
 - Remove all non parallelizable structures

Thank You

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