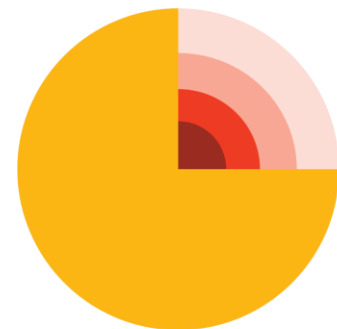




# SeisSol

## Status of ChEESE-2P Flagship Codes



**ChEESE**



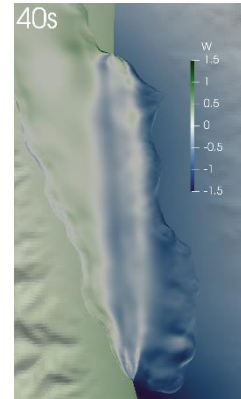
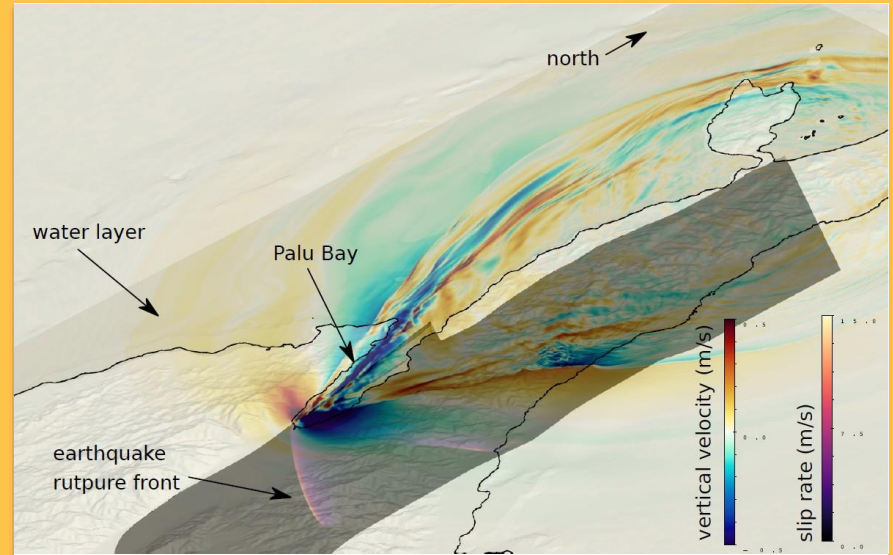
**SeisSol**  
([www.seissol.org](http://www.seissol.org))

Earthquake simulation  
software using high-order  
ADER-DG discretisation  
on fully-adaptive tetrahedral  
grids.

## Repositories:

<https://github.com/SeisSol/>  
<https://seissol.readthedocs.io/>

BSD license



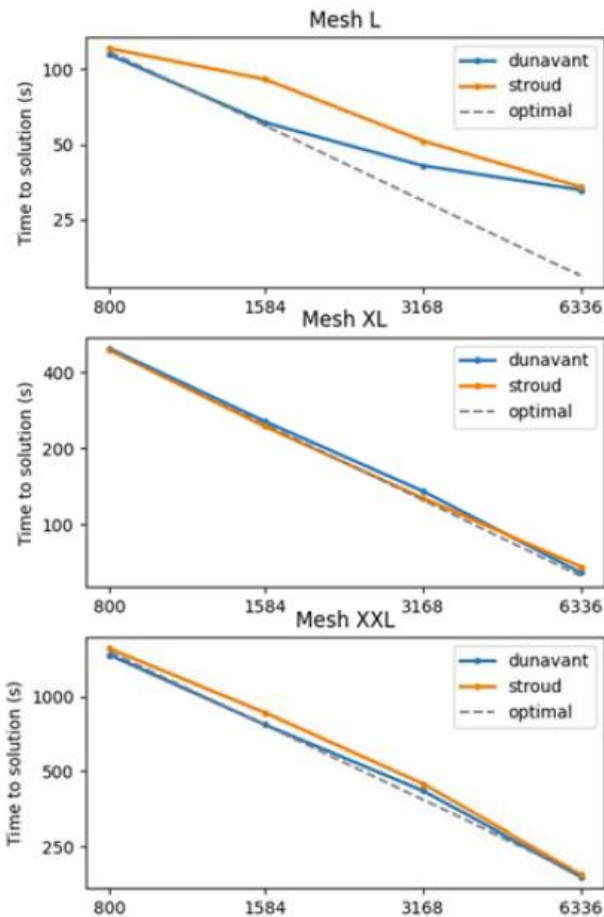


## SeisSol Team:

- Michael Bader (TUM)
  - Alice-Agnes Gabriel (LMU)
  - **Sebastian Wolf (TUM, SeisSol contact WP2)**
  - Thomas Ulrich (LMU)
  - Lukas Krenz (SeisSol@ChEERE)
  - Ravil Dorozhinskii (SeisSol@ChEERE) – contact for GPUs
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## Performance Status SeisSol:

- CPUs: scalable beyond petascale (~10,000 nodes);  
plot to the right: strong-scaling of Palu scenario on SuperMUC-NG
- GPUs: most major functionality now ported; see last slide for performance (GPU portability work in progress)
- Collaboration with TACC on next LCCF machine -> several full-machine runs
- First experiences gained on LUMI (MPI issues on AMD GPUs)



## SeisSol Release Information:

- Latest versions: v0.9.0, v1.0.0rc2 –  
see <https://github.com/SeisSol/SeisSol/releases>
- MPI+OpenMP (CPU),  
MPI+SYCL+X (with X=CUDA,HIP,SYCL,experimental:  
OpenMP)
- Mini-app: SeisSol Proxy

## Dependencies:

- x86 CPUs: LIBXSMM: <https://libxsmm.readthedocs.io/>
- GPUs: GemmForge and ChainForge:  
<https://github.com/ravil-mobile/gemmforge>  
<https://github.com/ravil-mobile/chainforge>

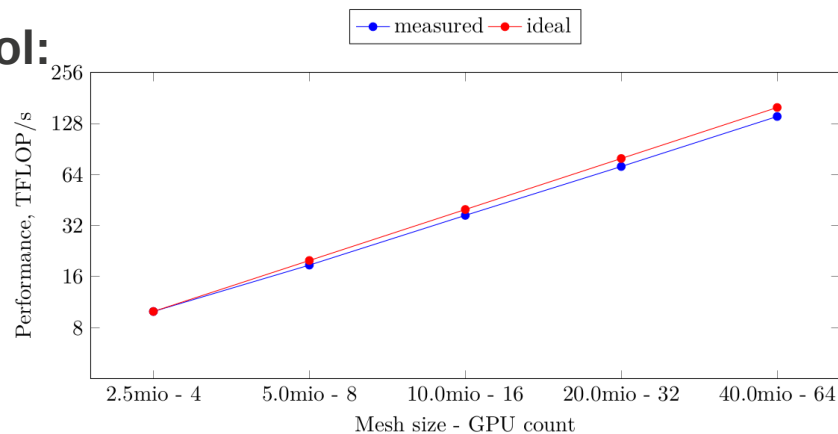


## Performance Portable SeisSol:

- Increased CPU flexibility and GPU port in CHEESE-1P

## Recent Work:

- From CUDA only to SYCL/HIP/CUDA/OpenMP
- Improved code generation (higher arithmetic intensity)
- CUDA Graphs for local time stepping (latency of CUDA calls)
- Full-machine runs on SuperMUC-NG and Frontera



Weak scaling of LOH.1 benchmark obtained on Marconi100 supercomputer.

