



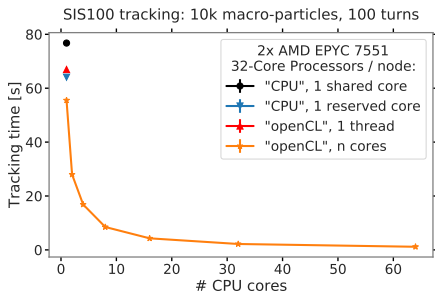
**SixTrackLib on kronos,
the GSI HPC farm**

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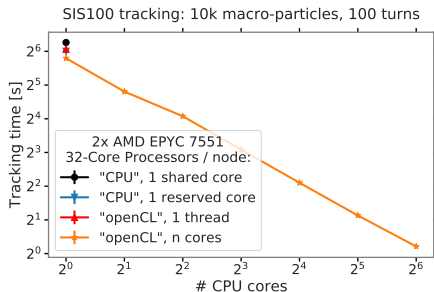
IT provided new singularity container with intel OpenCL drivers

⇒ we can run SixTrackLib on the cluster ↪ up to 64 cores per node!

Strong scaling study shows potential for 10'000 macro-particles over 100 turns of the full SIS100 lattice (only optics):



(a) timing on multi-core CPUs



(b) same as (a) in log-log scale

Figure: SixTrackLib tracking of full SIS100 lattice with 10'000 macro-particles and 100 turns.

IT has received 4 new high-end AMD GPUs for APH/BHS, the IT colleagues kindly installed them for us.

- connect to lxbk0595 or lxbk0598 as front-end
 - launch jobs via batch system to nodes lxbk0719 to lxbk0722
- ⇒ reserved for BHS group on kronos!

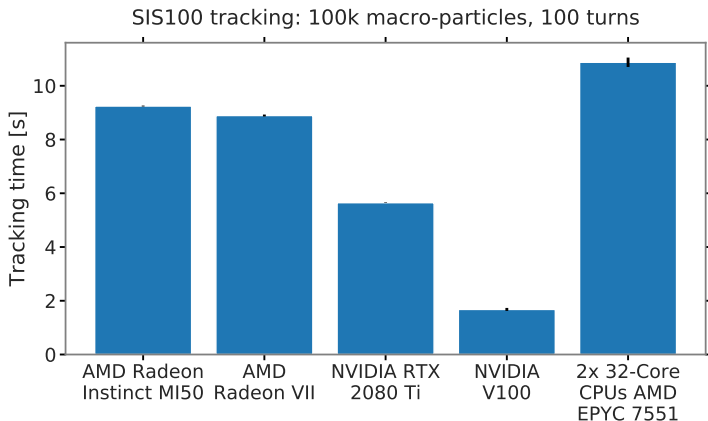
example for interactive session from lxbk0595

```
srun --reservation=hpc_10 --nodelist=lxbk0719 --pty bash -i
```

- useful for fast simulations, macro-particle convergence scans etc.
- ⇒ SixTrackLib on AMD via OpenCL supports optics + fixed frozen SC ¹

¹no matched frozen, adaptive or PIC available ⇨ only on NVIDIA hardware with CUDA-enabled PyHEADTAIL

To run on full load for GPUs, track 100'000 macro-particles over 100 turns of SIS100 lattice (just optics again):



In order to connect to the GPU front-end, please make sure that you have an HPC cluster account and that you provided public key authentication for SSH on kronos.

If not, log into an arbitrary kronos node (`$ ssh kronos.hpc.gsi.de`) and run this:

- `$ ssh-keygen`
- `$ ssh-copy-id kronos.hpc.gsi.de`
- enter your password
- ⇒ this lets you connect to another kronos node (such as the GPU front-end) without typing your password. (↪ IT has disabled password access to these nodes.)