



pyhpc-5950x

AMD Ryzen 9 5950X 16-Core testing with a ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3801 BIOS) and AMD Radeon RX 6700/6700 XT / 6800M 12GB on Ubuntu 21.10 via the Phoronix Test Suite.

Automated Executive Summary

1a had the most wins, coming in first place for 57% of the tests.

The results with the greatest spread from best to worst included:

PyHPC Benchmarks (Device: CPU - Backend: TensorFlow - Project Size: 65536 - Benchmark: Equation of State) at 1.5x

PyHPC Benchmarks (Device: CPU - Backend: Theano - Project Size: 65536 - Benchmark: Equation of State) at 1.25x

PyHPC Benchmarks (Device: CPU - Backend: PyTorch - Project Size: 4194304 - Benchmark: Equation of State) at 1.247x

PyHPC Benchmarks (Device: CPU - Backend: PyTorch - Project Size: 1048576 - Benchmark: Equation of State) at 1.235x

PyHPC Benchmarks (Device: CPU - Backend: JAX - Project Size: 65536 - Benchmark: Isonutral Mixing) at 1.182x

PyHPC Benchmarks (Device: CPU - Backend: JAX - Project Size: 262144 - Benchmark: Isonutral Mixing) at 1.1x

PyHPC Benchmarks (Device: CPU - Backend: JAX - Project Size: 1048576 - Benchmark: Equation of State) at 1.1x

PyHPC Benchmarks (Device: CPU - Backend: Numba - Project Size: 262144 - Benchmark: Equation of State) at 1.091x

PyHPC Benchmarks (Device: CPU - Backend: Bohrium - Project Size: 262144 - Benchmark: Equation of State) at 1.091x

1.067x

PyHPC Benchmarks (Device: CPU - Backend: Numba - Project Size: 4194304 - Benchmark: Isonutral Mixing) at 1.065x.

Test Systems:

1

1a

2

3

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (3801 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 1000GB Sabrent Rocket 4.0 Plus, Graphics: AMD Radeon RX 6700/6700 XT / 6800M 12GB (2855/1000MHz), Audio: AMD Navi 21 HDMI Audio, Monitor: ASUS MG28U, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 21.10, Kernel: 5.15.0-rc4-cluster-sched (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server + Wayland, OpenGL: 4.6 Mesa 21.2.2 (LLVM 12.0.1), Vulkan: 1.2.182, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise

Processor Notes: Scaling Governor: acpi-cpufreq schedutil (Boost: Enabled) - CPU Microcode: 0xa201016

Python Notes: Python 3.9.7

Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	1	1a	2	3
PyHPC Benchmarks - CPU - JAX - 262144 - Equation of State (sec)		0.002	0.002	0.002
PyHPC Benchmarks - CPU - Numpy - 4194304 - Isonutral Mixing (sec)		1.988	1.975	2.005
Normalized		99.35%	100%	98.5%
PyHPC Benchmarks - CPU - JAX - 16384 - Isonutral Mixing (sec)		0.002	0.002	0.002
PyHPC Benchmarks - CPU - PyTorch - 4194304 - Isonutral Mixing (sec)		1.378	1.415	1.459
Normalized		100%	97.39%	94.45%

PyHPC Benchmarks - CPU - Theano - 4194304 - Isonutral Mixing (sec)	1.331	1.315	1.33
Normalized	98.8%	100%	98.87%
PyHPC Benchmarks - CPU - Bohrium - 4194304 - Isonutral Mixing (sec)	1.137	1.108	1.152
Normalized	97.45%	100%	96.18%
PyHPC Benchmarks - CPU - Numba - 16384 - Isonutral Mixing (sec)	0.003	0.003	0.003
PyHPC Benchmarks - CPU - JAX - 4194304 - Isonutral Mixing (sec)	0.681	0.69	0.68
Normalized	99.85%	98.55%	100%
PyHPC Benchmarks - CPU - Numba - 4194304 - Isonutral Mixing (sec)	1.039	0.997	1.062
Normalized	95.96%	100%	93.88%
PyHPC Benchmarks - CPU - JAX - 1048576 - Isonutral Mixing (sec)	0.167	0.163	0.164
Normalized	97.6%	100%	99.39%
PyHPC Benchmarks - CPU - Numba - 1048576 - Isonutral Mixing (sec)	0.243	0.242	0.243
Normalized	99.59%	100%	99.59%
PyHPC Benchmarks - CPU - Bohrium - 1048576 - Isonutral Mixing (sec)	0.292	0.291	0.303
Normalized	99.66%	100%	96.04%
PyHPC Benchmarks - CPU - Theano - 1048576 - Isonutral Mixing (sec)	0.298	0.302	0.304
Normalized	100%	98.68%	98.03%
PyHPC Benchmarks - CPU - TensorFlow - 65536 - Equation of	0.002	0.003	0.003
Normalized	100%	66.67%	66.67%
PyHPC Benchmarks - CPU - TensorFlow - 1048576 - Equation of	0.023	0.023	0.023
PyHPC Benchmarks - CPU - Theano - 4194304 - Equation of State (sec)	0.27	0.27	0.267
Normalized	98.89%	98.89%	100%
PyHPC Benchmarks - CPU - Numpy - 65536 - Isonutral Mixing (sec)	0.025	0.025	0.025
PyHPC Benchmarks - CPU - Numpy - 4194304 - Equation of State (sec)	1.07	1.07	1.085
Normalized	100%	100%	98.62%
PyHPC Benchmarks - CPU - Bohrium - 4194304 - Equation of State (sec)	0.226	0.236	0.231
Normalized	100%	95.76%	97.84%
PyHPC Benchmarks - CPU - Theano - 65536 - Isonutral Mixing (sec)	0.016	0.016	0.016
PyHPC Benchmarks - CPU - JAX - 65536 - Isonutral Mixing (sec)	0.011	0.013	0.011
Normalized	100%	84.62%	100%
PyHPC Benchmarks - CPU - Numba - 4194304 - Equation of State (sec)	0.187	0.189	0.187
Normalized	100%	98.94%	100%

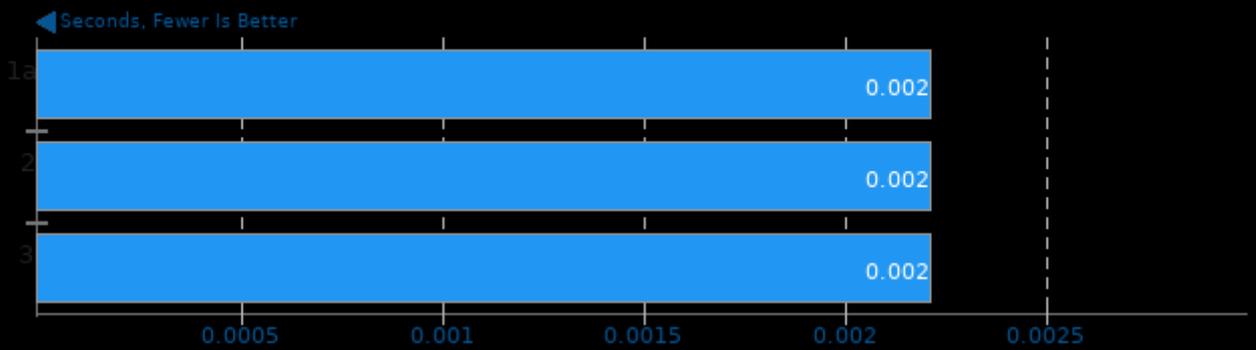
PyHPC Benchmarks - CPU - TensorFlow - 4194304 - Equation of State (sec)	0.118	0.116	0.111
Normalized	94.07%	95.69%	100%
PyHPC Benchmarks - CPU - Numba - 65536 - Isonutral Mixing (sec)	0.014	0.014	0.014
PyHPC Benchmarks - CPU - JAX - 1048576 - Equation of State (sec)	0.011	0.01	0.01
Normalized	90.91%	100%	100%
PyHPC Benchmarks - CPU - Bohrium - 16384 - Isonutral Mixing (sec)	0.028	0.027	0.027
Normalized	96.43%	100%	100%
PyHPC Benchmarks - CPU - Bohrium - 65536 - Equation of State (sec)	0.022	0.022	0.021
Normalized	95.45%	95.45%	100%
PyHPC Benchmarks - CPU - Numpy - 1048576 - Equation of State (sec)	0.186	0.182	0.186
Normalized	97.85%	100%	97.85%
PyHPC Benchmarks - CPU - Theano - 16384 - Isonutral Mixing (sec)	0.004	0.004	0.004
PyHPC Benchmarks - CPU - Theano - 262144 - Equation of State (sec)	0.017	0.017	0.017
PyHPC Benchmarks - CPU - Numpy - 1048576 - Isonutral Mixing (sec)	0.453	0.447	0.448
Normalized	98.68%	100%	99.78%
PyHPC Benchmarks - CPU - Bohrium - 16384 - Equation of State (sec)	0.019	0.018	0.019
Normalized	94.74%	100%	94.74%
PyHPC Benchmarks - CPU - Bohrium - 262144 - Isonutral Mixing (sec)	0.092	0.088	0.09
Normalized	95.65%	100%	97.78%
PyHPC Benchmarks - CPU - JAX - 65536 - Equation of State (sec)	0.001	0.001	0.001
PyHPC Benchmarks - CPU - Numpy - 262144 - Isonutral Mixing (sec)	0.098	0.095	0.097
Normalized	96.94%	100%	97.94%
PyHPC Benchmarks - CPU - PyTorch - 1048576 - Isonutral Mixing (sec)	0.286	0.285	0.288
Normalized	99.65%	100%	98.96%
PyHPC Benchmarks - CPU - Numba - 65536 - Equation of State (sec)	0.003	0.003	0.003
PyHPC Benchmarks - CPU - Theano - 262144 - Isonutral Mixing (sec)	0.06	0.06	0.061
Normalized	100%	100%	98.36%
PyHPC Benchmarks - CPU - Theano - 16384 - Equation of State (sec)	0.001	0.001	0.001
PyHPC Benchmarks - CPU - Numba - 262144 - Equation of State (sec)	0.011	0.011	0.012
Normalized	100%	100%	91.67%

PyHPC Benchmarks - CPU - JAX - 4194304 - Equation of State (sec)	0.04	0.04	0.039
Normalized	97.5%	97.5%	100%
PyHPC Benchmarks - CPU - Bohrium - 262144 - Equation of State (sec)	0.032	0.03	0.031
Normalized	93.75%	100%	96.77%
PyHPC Benchmarks - CPU - TensorFlow - 16384 - Equation of PyHPC Benchmarks - CPU - JAX - 262144 - Isonutral Mixing (sec)	0.033	0.031	0.03
Normalized	90.91%	96.77%	100%
PyHPC Benchmarks - CPU - Numba - 262144 - Isonutral Mixing (sec)	0.053	0.056	0.053
Normalized	100%	94.64%	100%
PyHPC Benchmarks - CPU - PyTorch - 4194304 - Equation of State (sec)	0.073	0.076	0.091
Normalized	100%	96.05%	80.22%
PyHPC Benchmarks - CPU - Numpy - 65536 - Equation of State (sec)	0.011	0.011	0.011
PyHPC Benchmarks - CPU - Theano - 1048576 - Equation of State (sec)	0.069	0.069	0.067
Normalized	97.1%	97.1%	100%
PyHPC Benchmarks - CPU - TensorFlow - 262144 - Equation of PyHPC Benchmarks - CPU - Numba - 16384 - Equation of State (sec)	0.001	0.001	0.001
PyHPC Benchmarks - CPU - Bohrium - 1048576 - Equation of State (sec)	0.07	0.072	0.074
Normalized	100%	97.22%	94.59%
PyHPC Benchmarks - CPU - Numpy - 16384 - Isonutral Mixing (sec)	0.006	0.006	0.006
PyHPC Benchmarks - CPU - Bohrium - 65536 - Isonutral Mixing (sec)	0.039	0.04	0.04
Normalized	100%	97.5%	97.5%
PyHPC Benchmarks - CPU - Numba - 1048576 - Equation of State (sec)	0.047	0.046	0.047
Normalized	97.87%	100%	97.87%
PyHPC Benchmarks - CPU - PyTorch - 1048576 - Equation of State (sec)	0.017	0.019	0.021
Normalized	100%	89.47%	80.95%
PyHPC Benchmarks - CPU - Theano - 65536 - Equation of State (sec)	0.005	0.004	0.005
Normalized	80%	100%	80%
PyHPC Benchmarks - CPU - Numpy - 262144 - Equation of State (sec)	0.044	0.043	0.045
Normalized	97.73%	100%	95.56%
PyHPC Benchmarks - CPU - PyTorch - 262144 - Isonutral Mixing (sec)	0.055	0.054	0.055
Normalized	98.18%	100%	98.18%

PyHPC Benchmarks - CPU - PyTorch - 65536 - Equation of State (sec)	0.001	0.001	0.001
PyHPC Benchmarks - CPU - PyTorch - 262144 - Equation of State (sec)	0.004	0.004	0.004
PyHPC Benchmarks - CPU - Numpy - 16384 - Equation of State (sec)	0.002	0.002	0.002
PyHPC Benchmarks - CPU - PyTorch - 65536 - Isonutral Mixing (sec)	0.014	0.014	0.014
PyHPC Benchmarks - CPU - PyTorch - 16384 - Isonutral Mixing (sec)	0.004	0.004	0.004

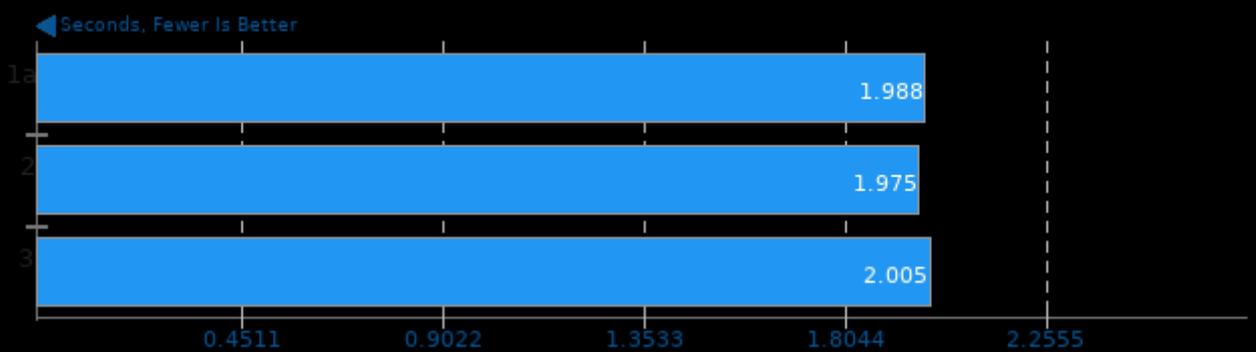
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 262144 - Benchmark: Equation of State



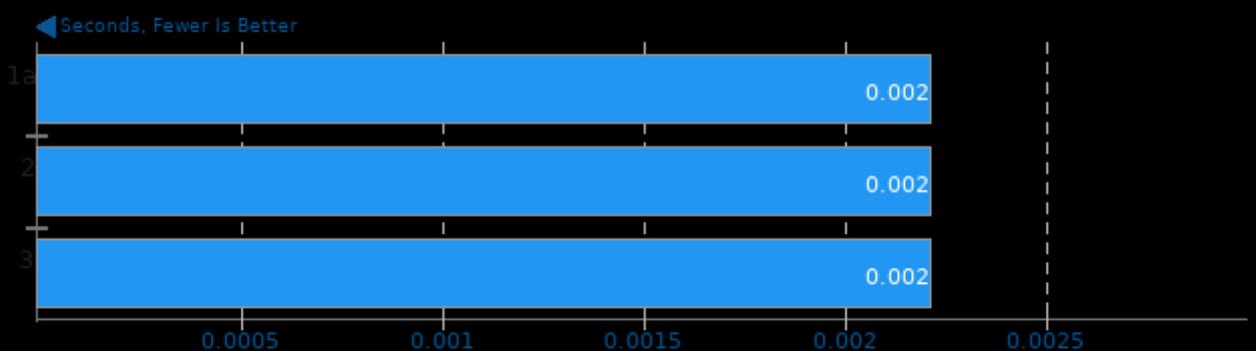
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 4194304 - Benchmark: Isonneutral Mixing



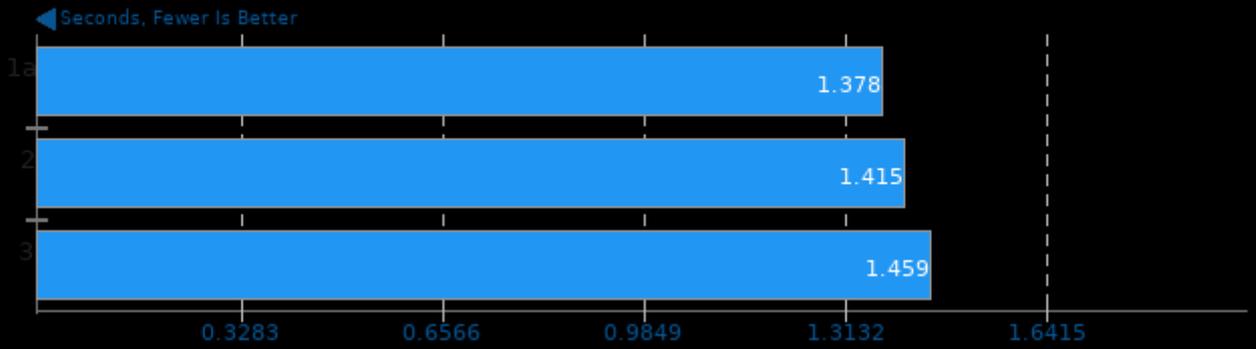
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 16384 - Benchmark: Isonneutral Mixing



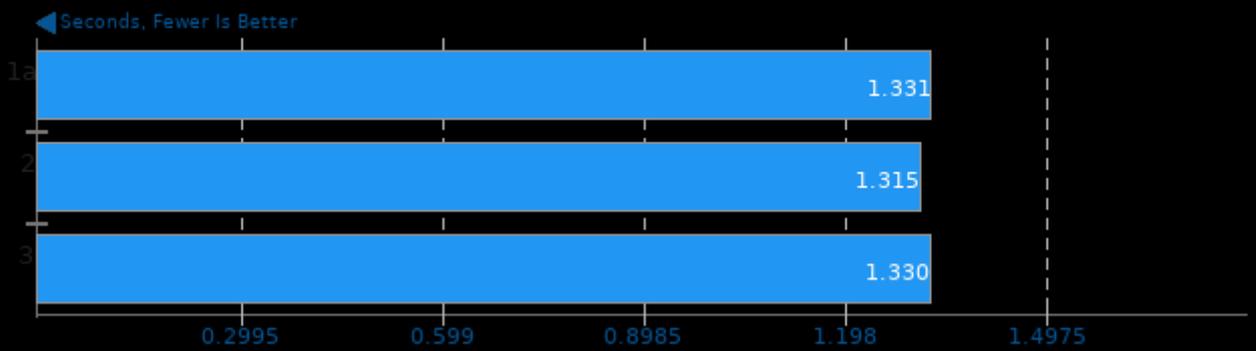
PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 4194304 - Benchmark: Isonneutral Mixing



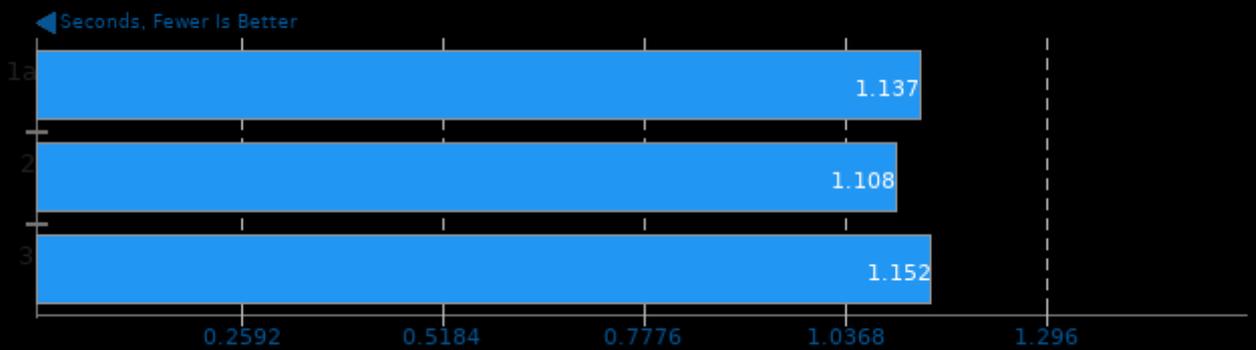
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 4194304 - Benchmark: Isonneutral Mixing



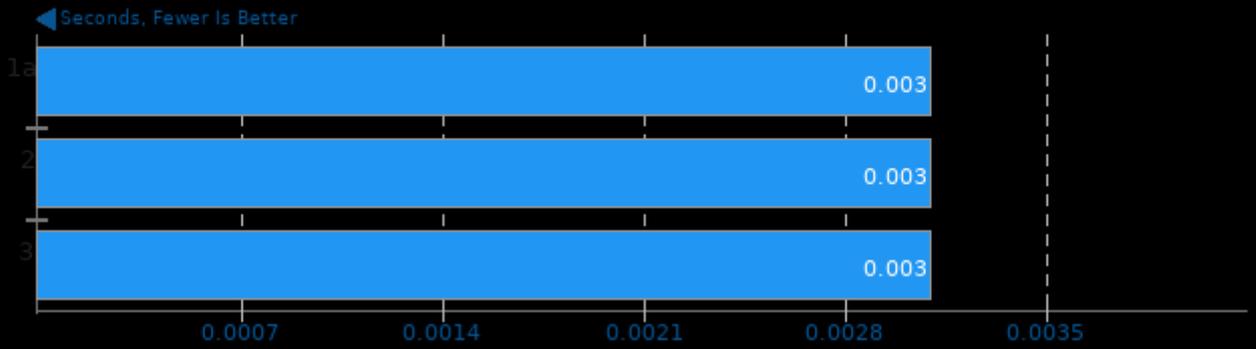
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 4194304 - Benchmark: Isonneutral Mixing



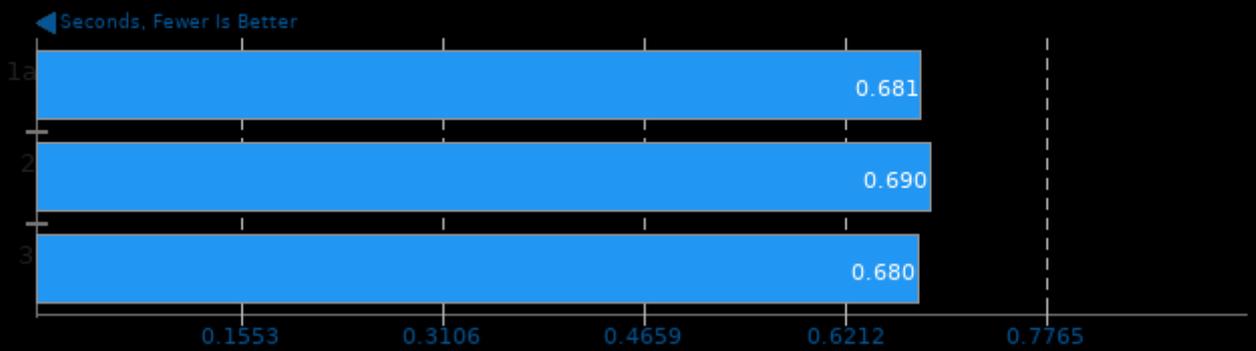
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numba - Project Size: 16384 - Benchmark: Isonutral Mixing



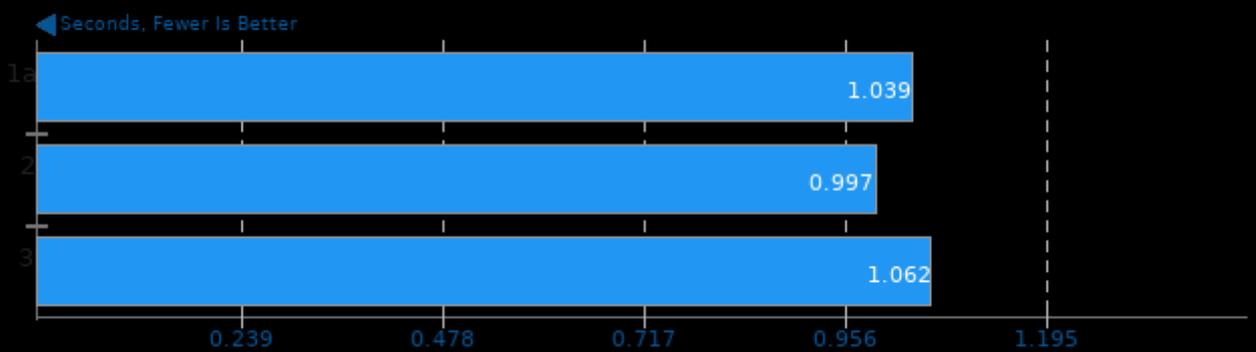
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 4194304 - Benchmark: Isonutral Mixing



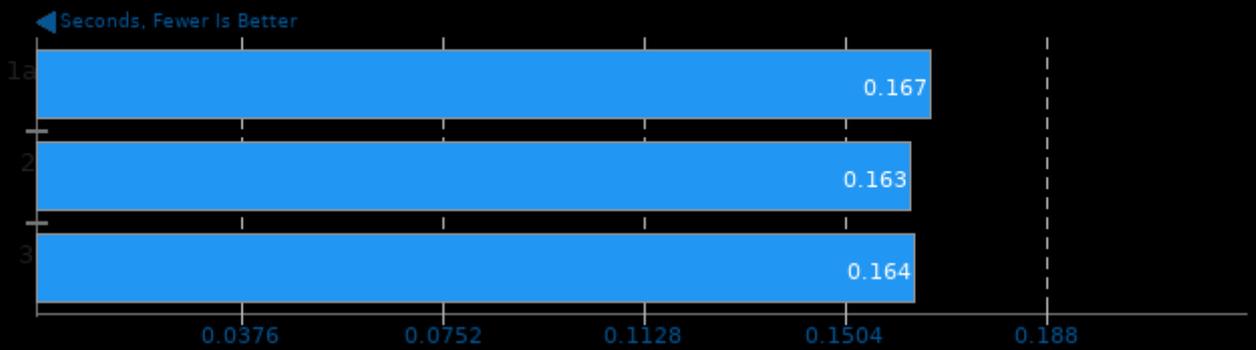
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Device: CPU - Backend: Numba - Project Size: 4194304 - Benchmark: Isonutral Mixing



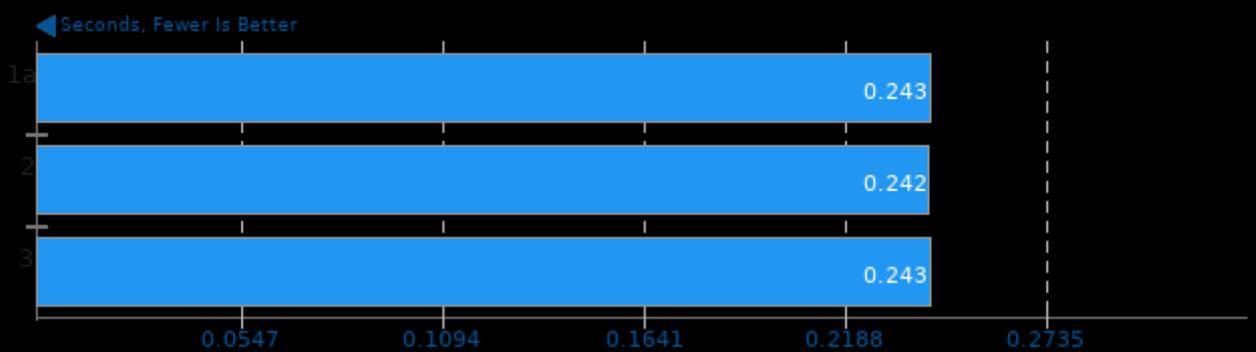
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 1048576 - Benchmark: Isonneutral Mixing



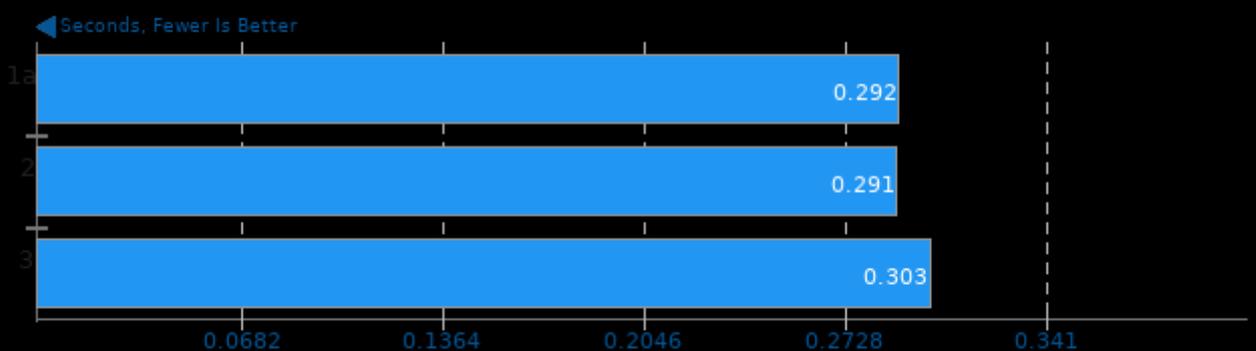
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Device: CPU - Backend: Numba - Project Size: 1048576 - Benchmark: Isonneutral Mixing



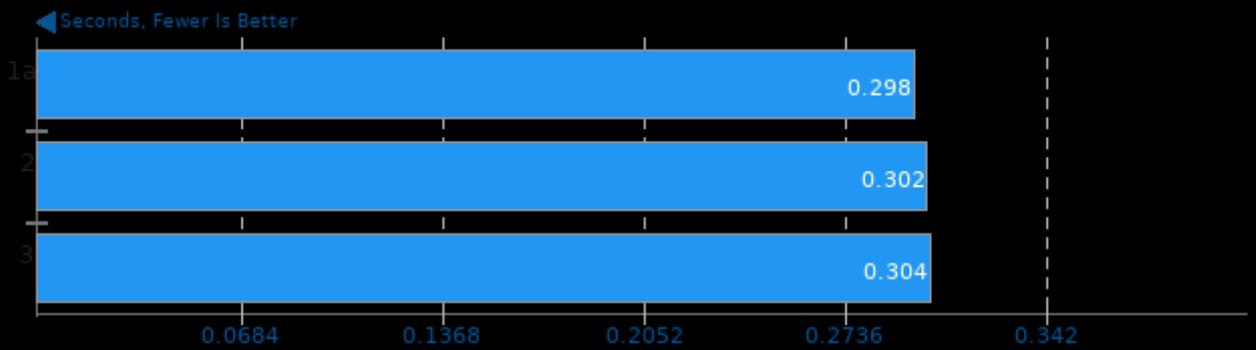
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 1048576 - Benchmark: Isonneutral Mixing



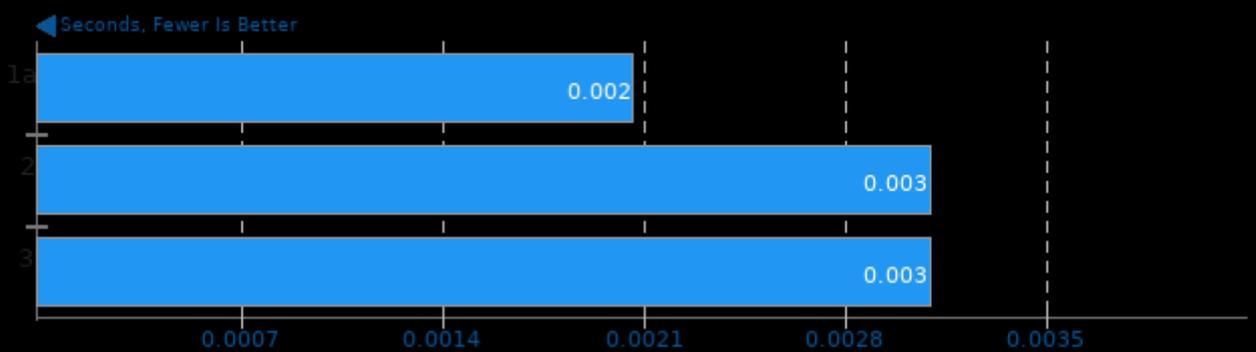
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 1048576 - Benchmark: Isonneutral Mixing



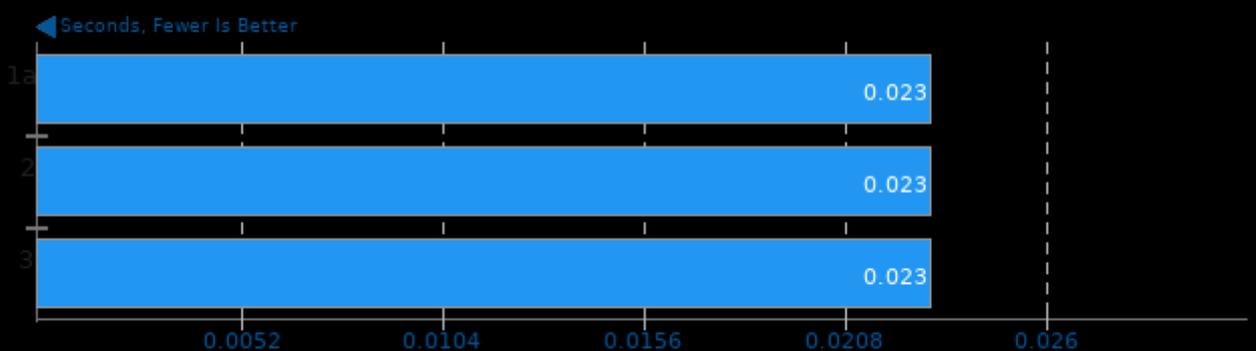
PyHPC Benchmarks 2.1

Device: CPU - Backend: TensorFlow - Project Size: 65536 - Benchmark: Equation of State



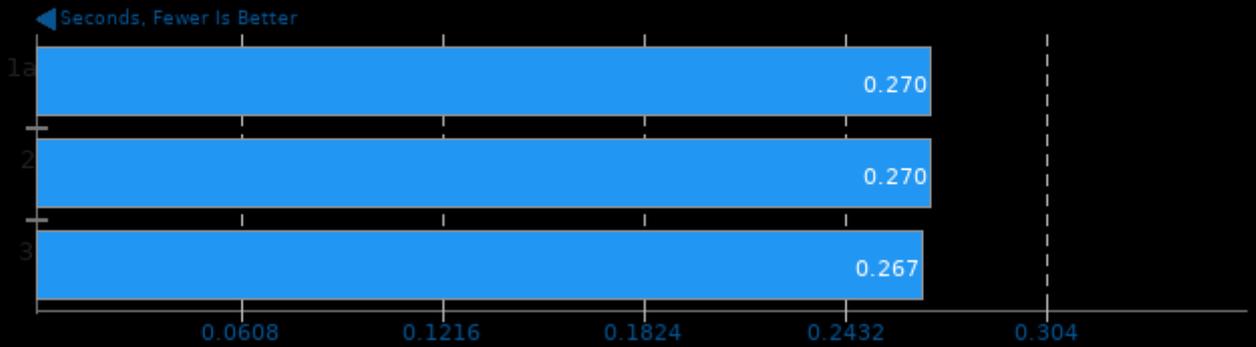
PyHPC Benchmarks 2.1

Device: CPU - Backend: TensorFlow - Project Size: 1048576 - Benchmark: Equation of State



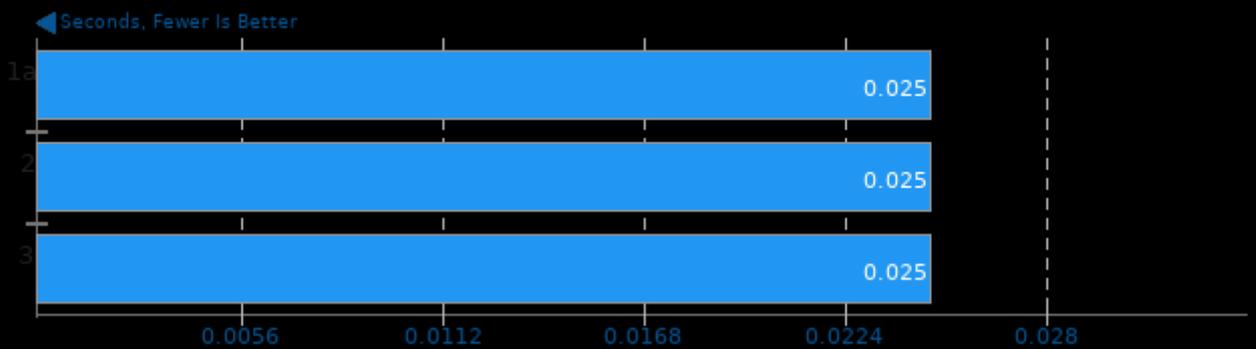
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 4194304 - Benchmark: Equation of State



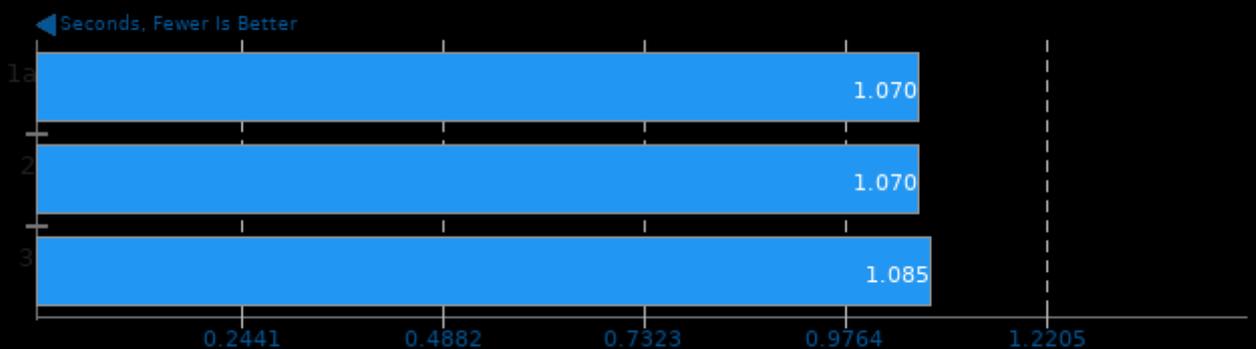
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 65536 - Benchmark: Isonneutral Mixing



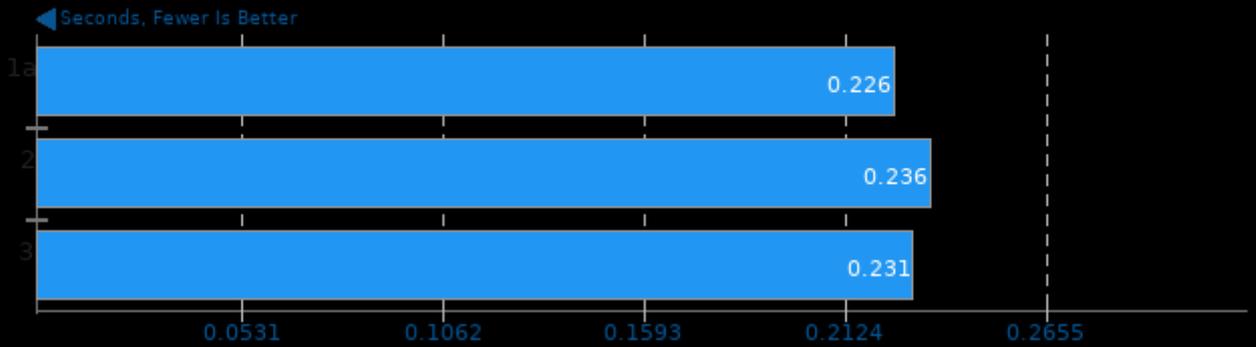
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 4194304 - Benchmark: Equation of State



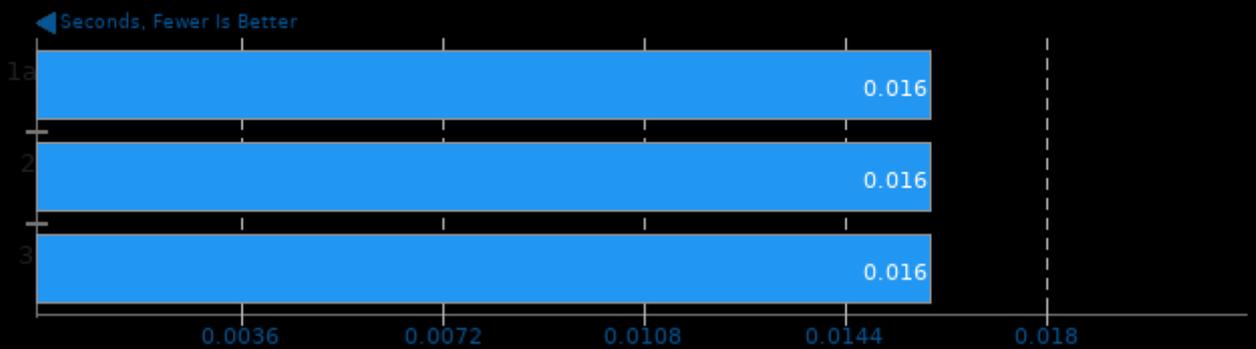
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 4194304 - Benchmark: Equation of State



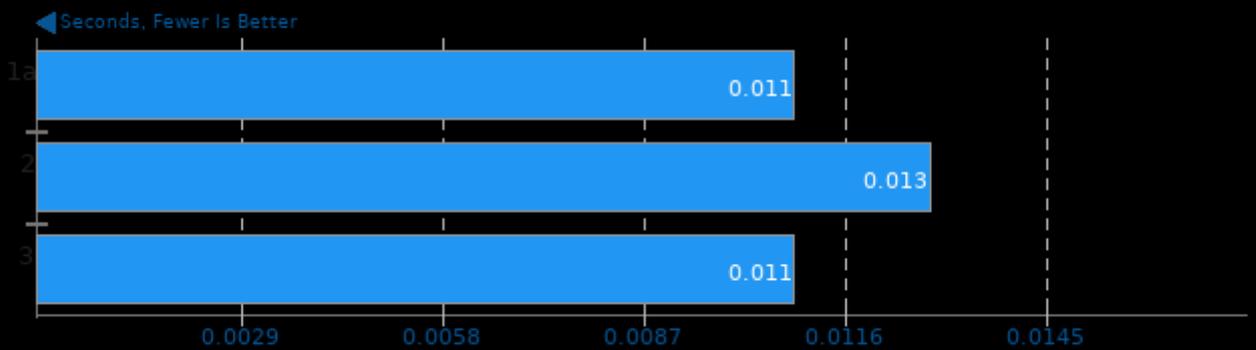
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 65536 - Benchmark: Isonutral Mixing



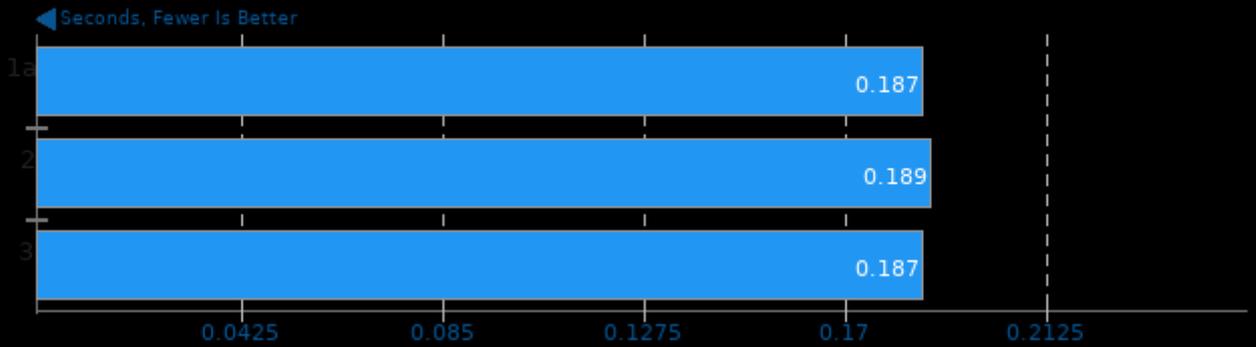
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 65536 - Benchmark: Isonutral Mixing



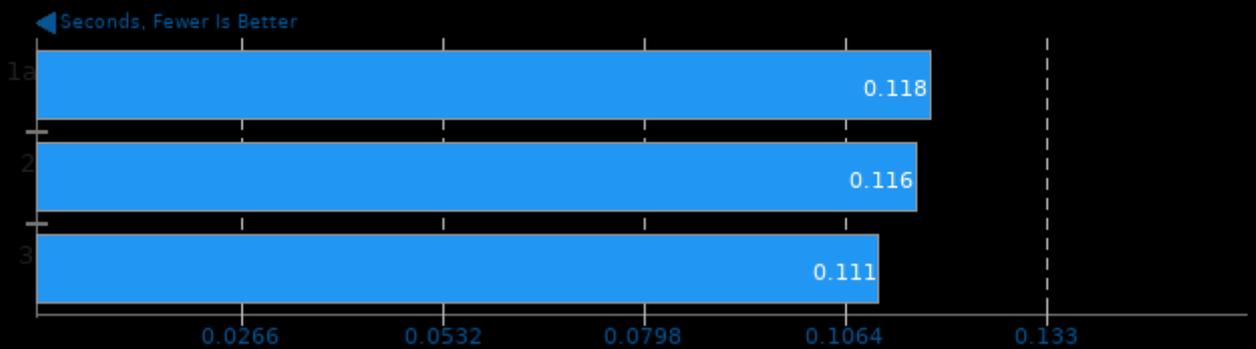
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numba - Project Size: 4194304 - Benchmark: Equation of State



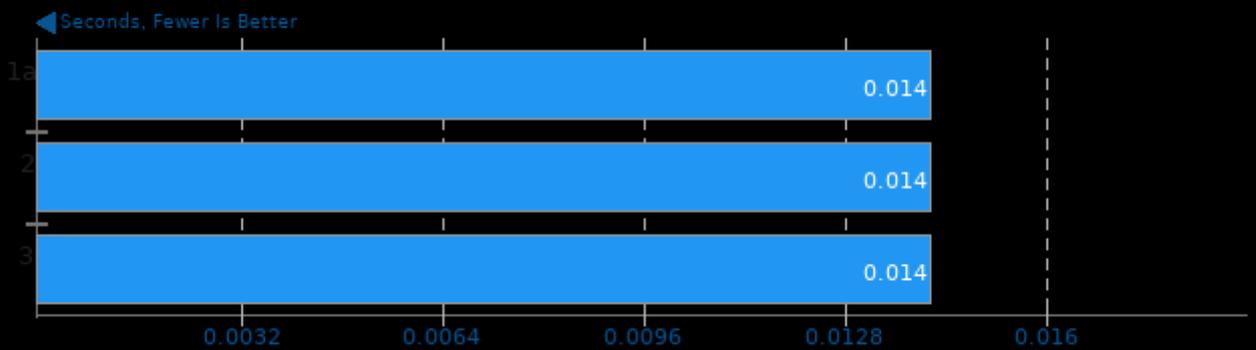
PyHPC Benchmarks 2.1

Device: CPU - Backend: TensorFlow - Project Size: 4194304 - Benchmark: Equation of State



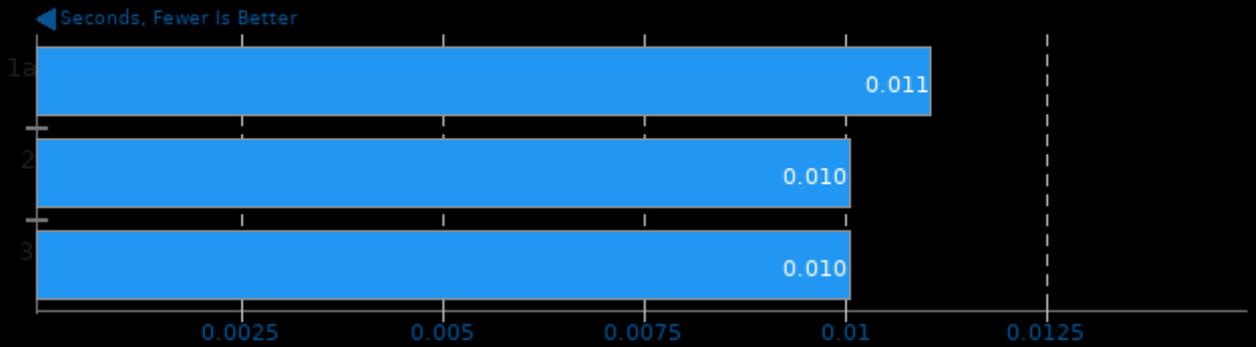
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numba - Project Size: 65536 - Benchmark: Isonneutral Mixing



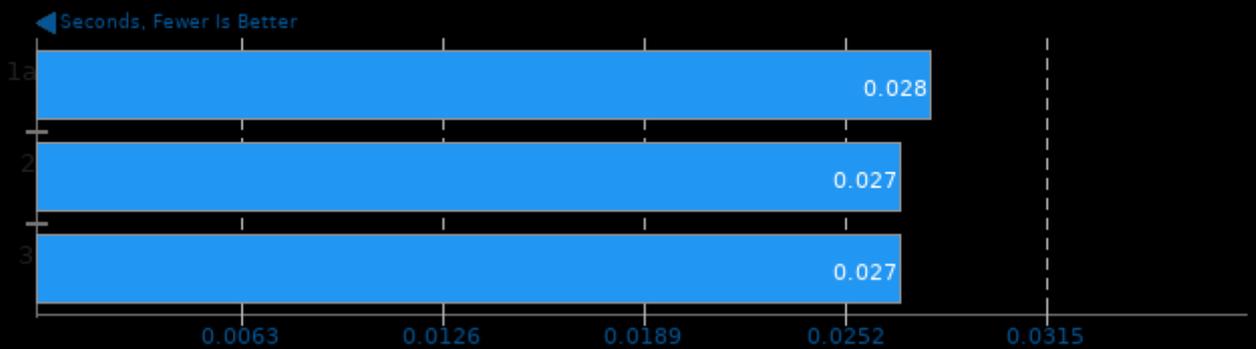
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 1048576 - Benchmark: Equation of State



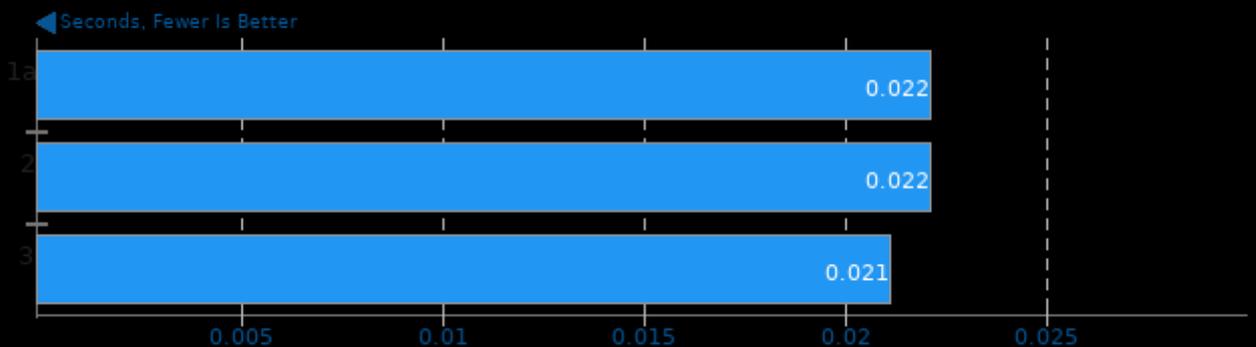
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 16384 - Benchmark: Isonneutral Mixing



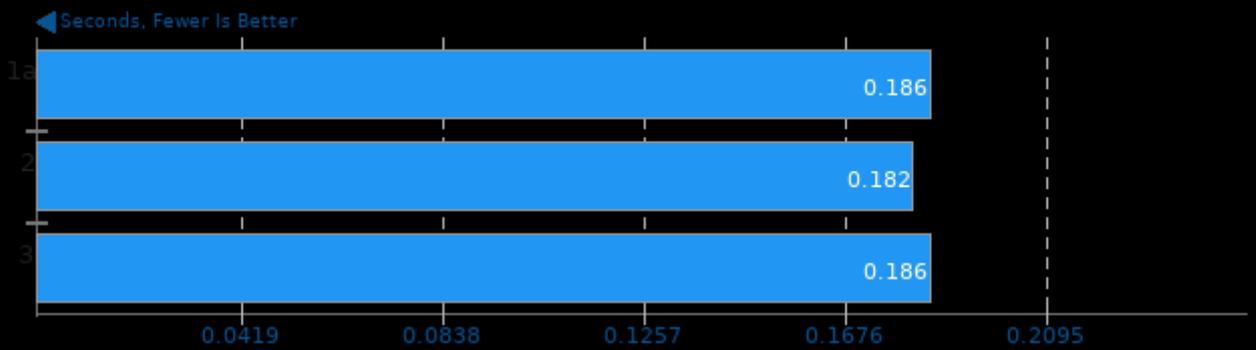
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 65536 - Benchmark: Equation of State



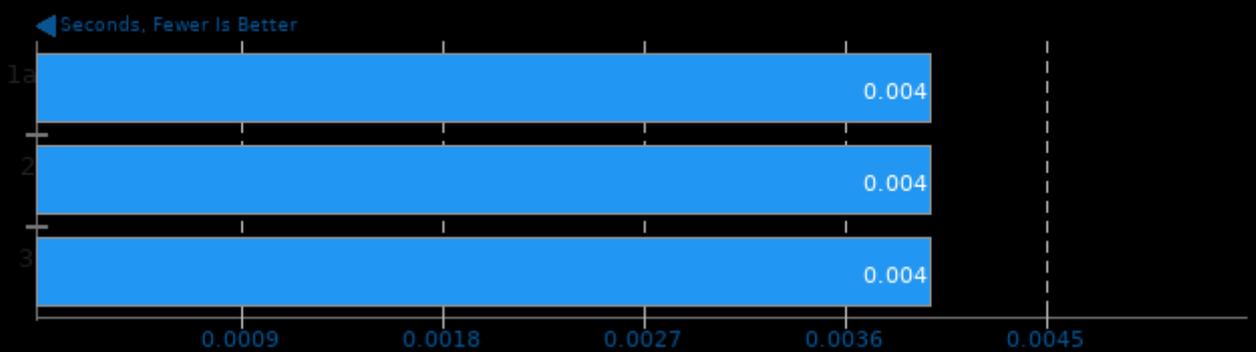
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 1048576 - Benchmark: Equation of State



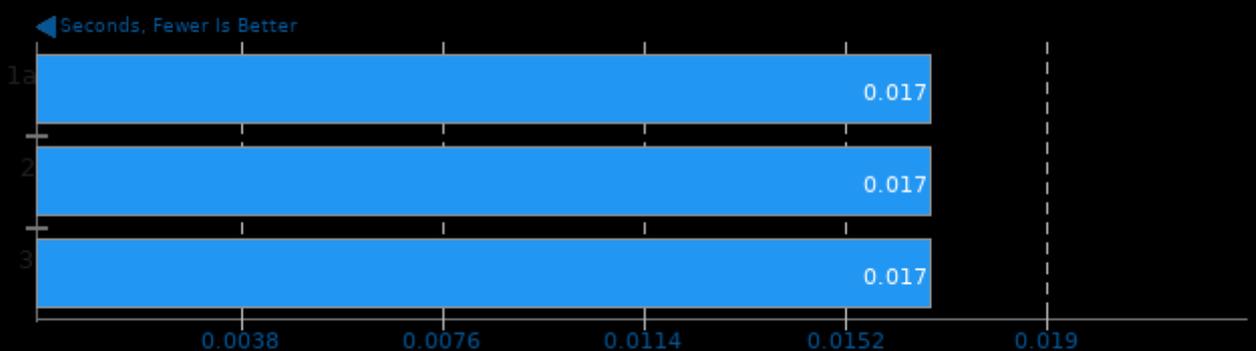
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 16384 - Benchmark: Isonutral Mixing



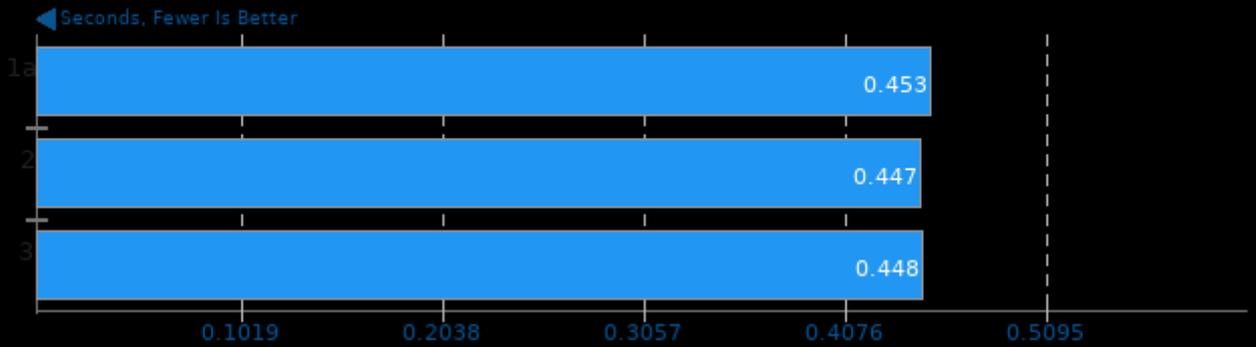
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 262144 - Benchmark: Equation of State



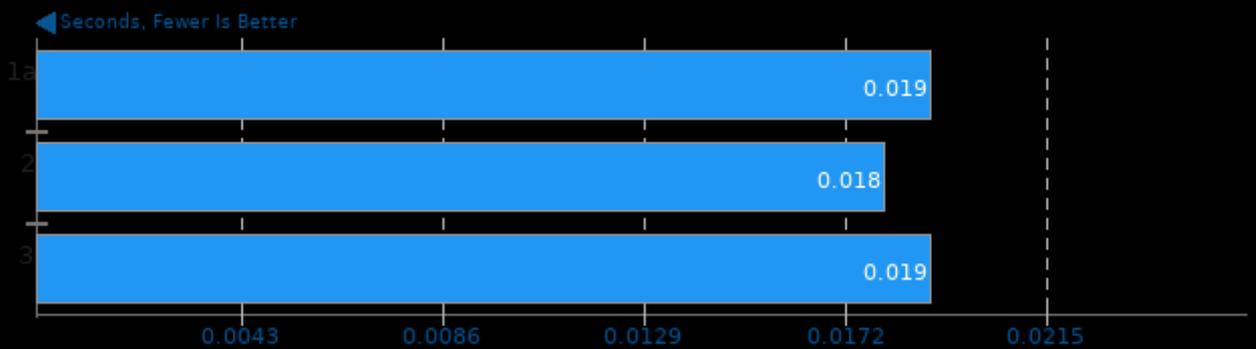
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 1048576 - Benchmark: Isonneutral Mixing



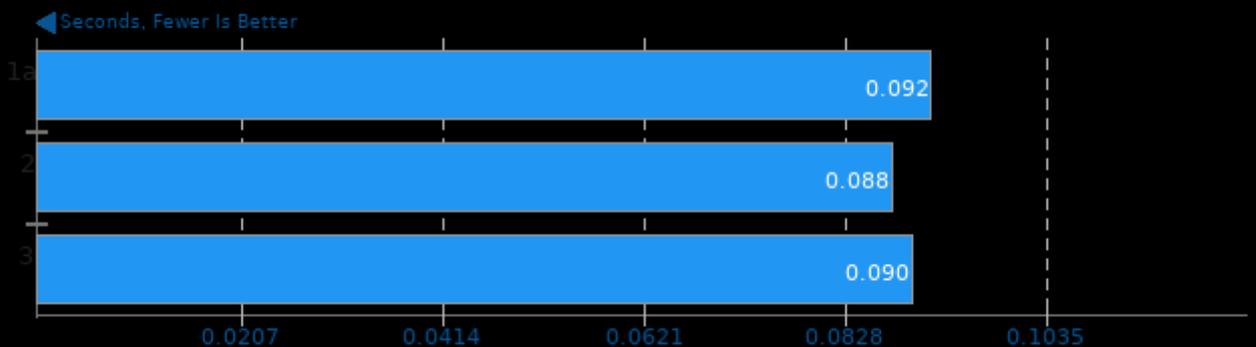
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 16384 - Benchmark: Equation of State



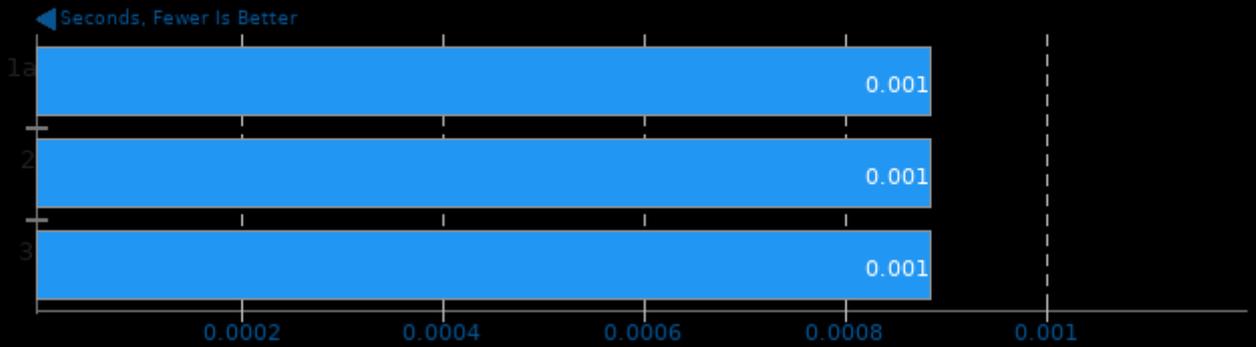
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 262144 - Benchmark: Isonneutral Mixing



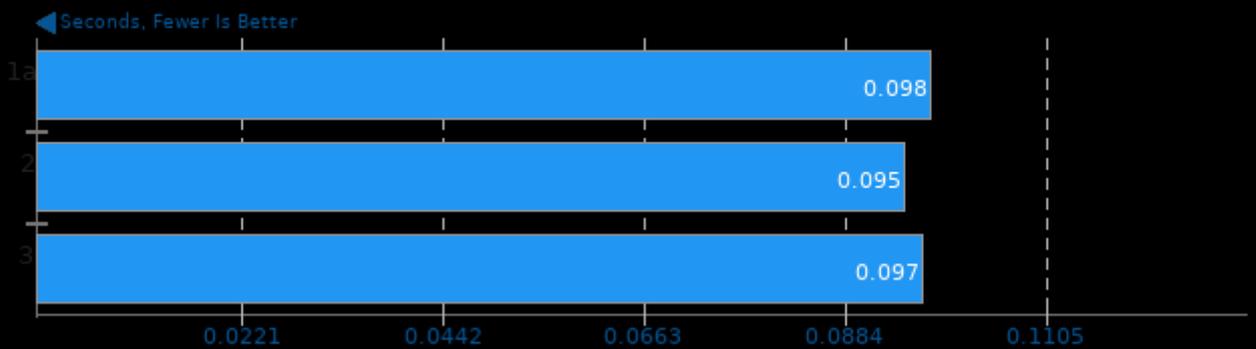
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 65536 - Benchmark: Equation of State



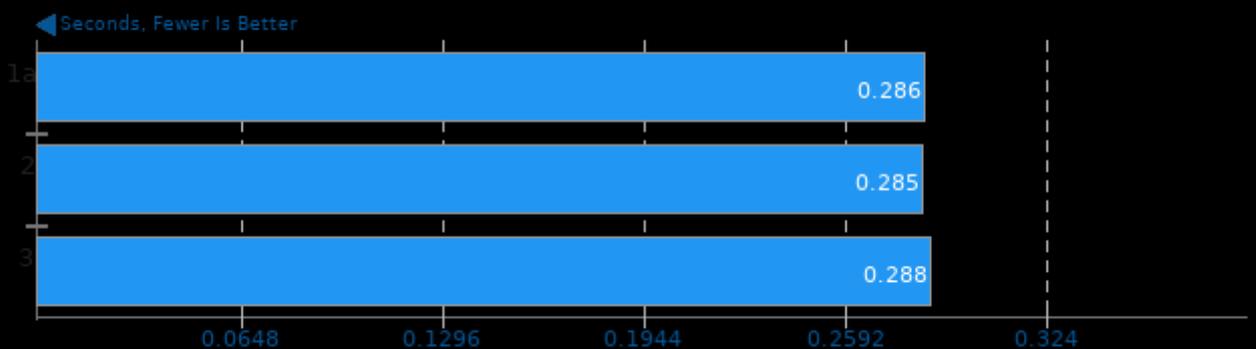
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 262144 - Benchmark: Isonneutral Mixing



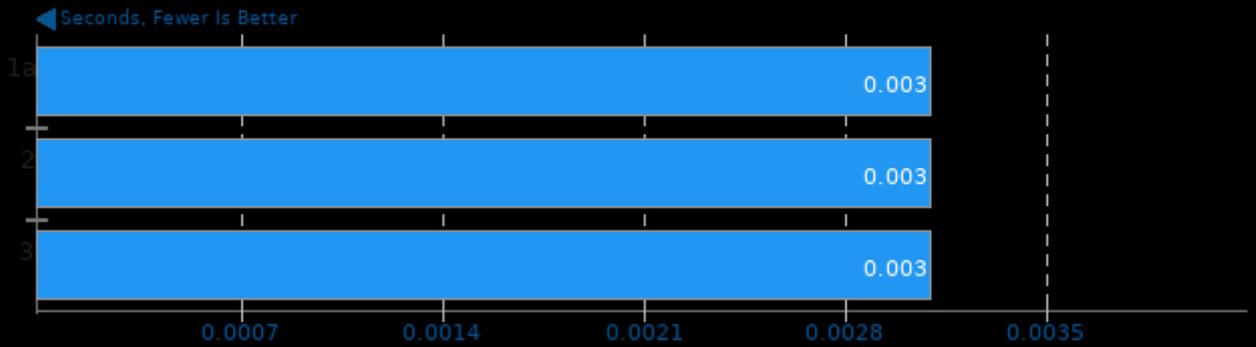
PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 1048576 - Benchmark: Isonneutral Mixing



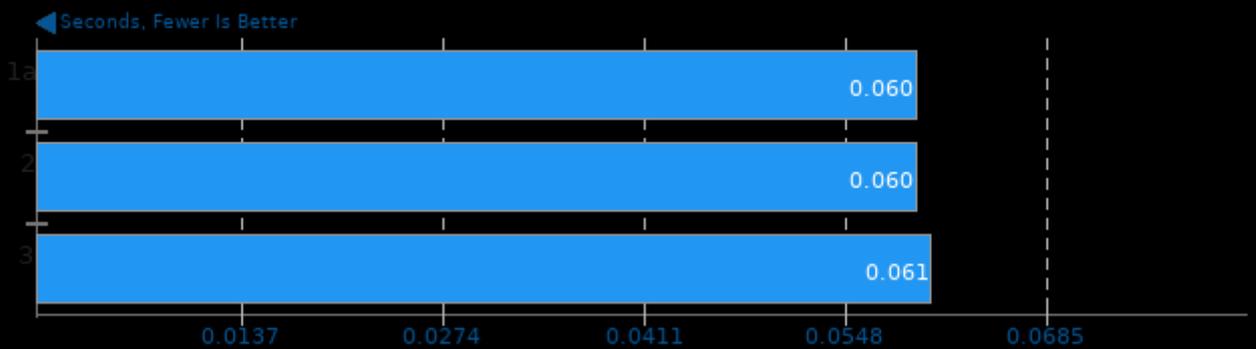
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numba - Project Size: 65536 - Benchmark: Equation of State



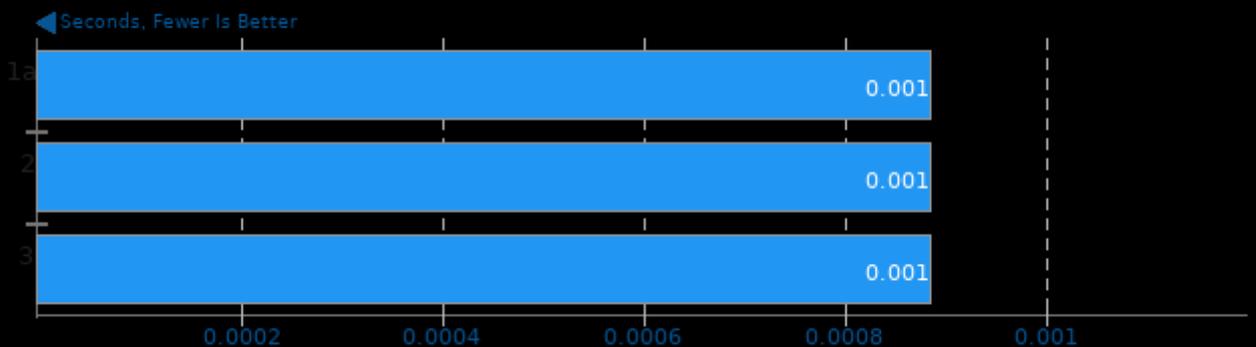
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 262144 - Benchmark: Isonutral Mixing



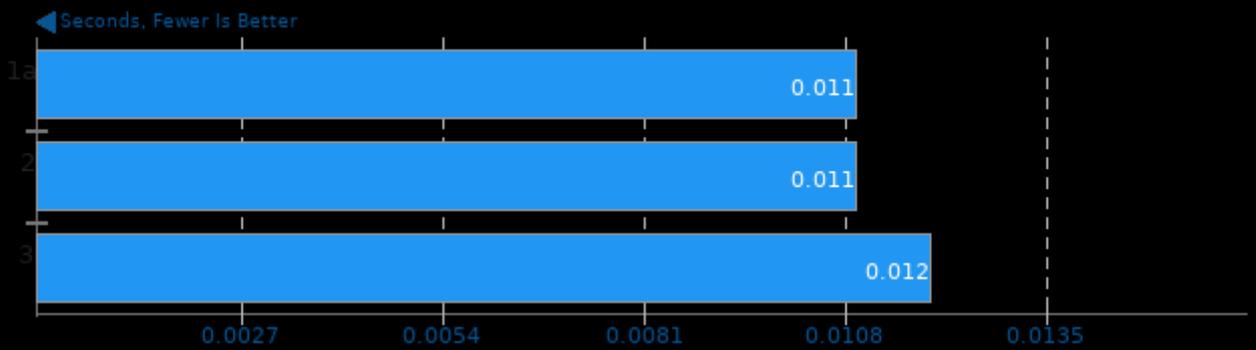
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 16384 - Benchmark: Equation of State



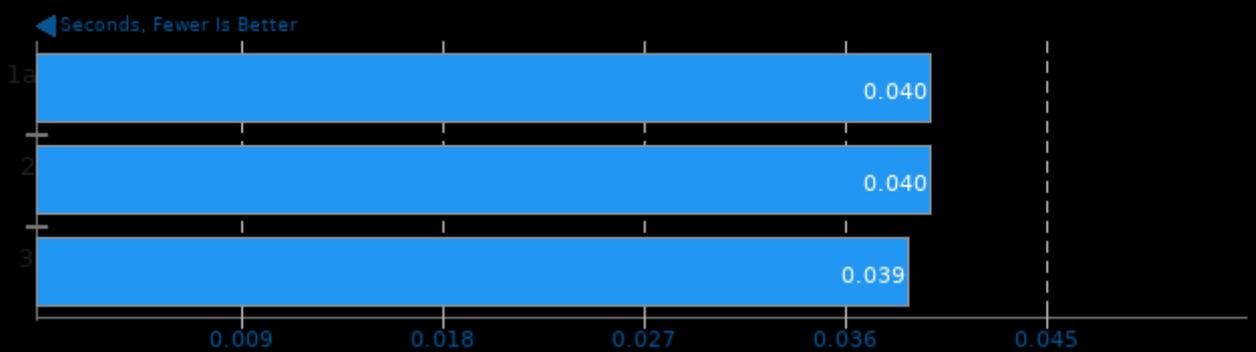
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numba - Project Size: 262144 - Benchmark: Equation of State



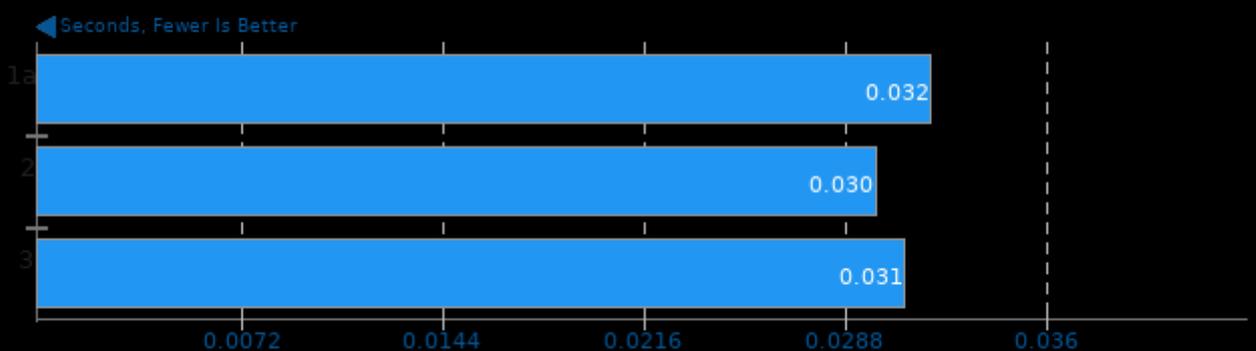
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 4194304 - Benchmark: Equation of State



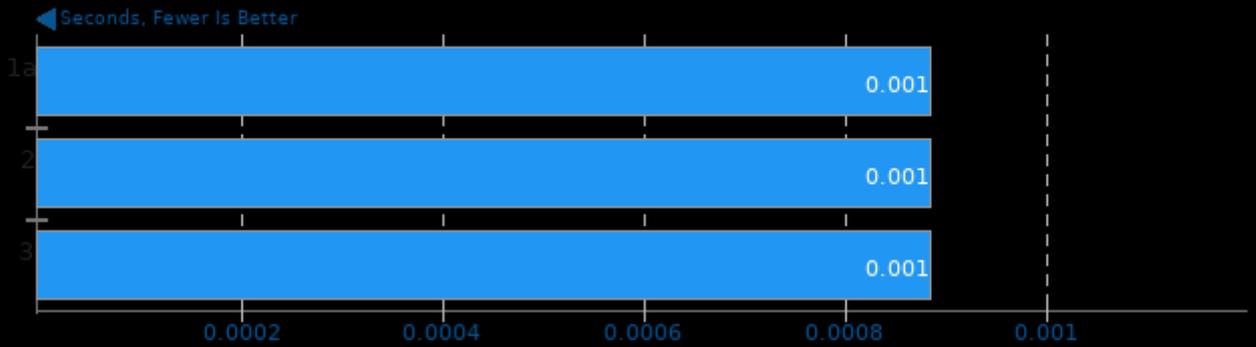
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 262144 - Benchmark: Equation of State



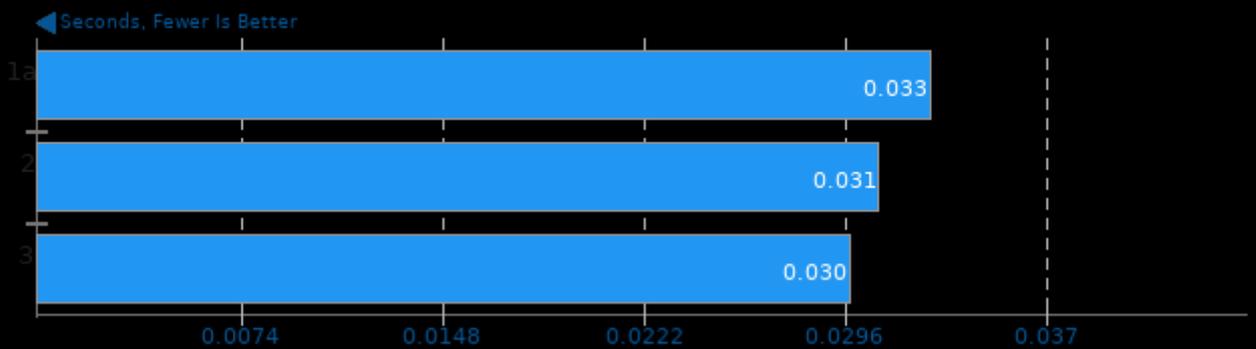
PyHPC Benchmarks 2.1

Device: CPU - Backend: TensorFlow - Project Size: 16384 - Benchmark: Equation of State



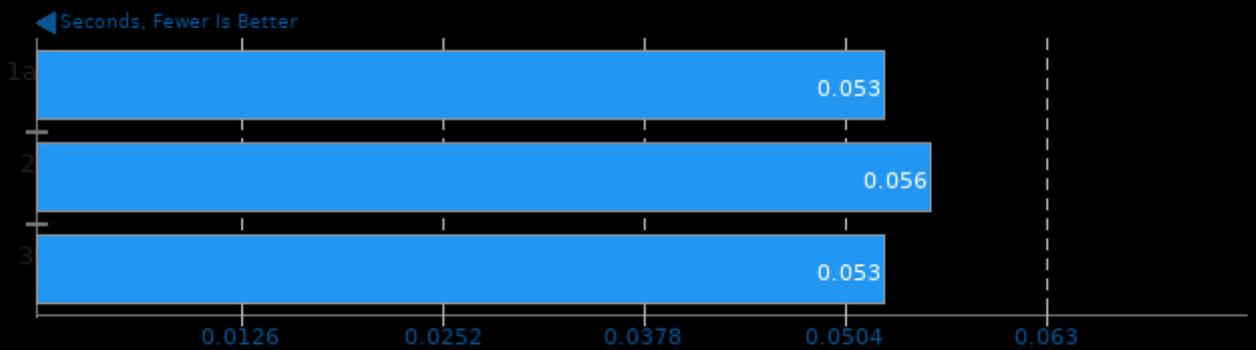
PyHPC Benchmarks 2.1

Device: CPU - Backend: JAX - Project Size: 262144 - Benchmark: Isonutral Mixing



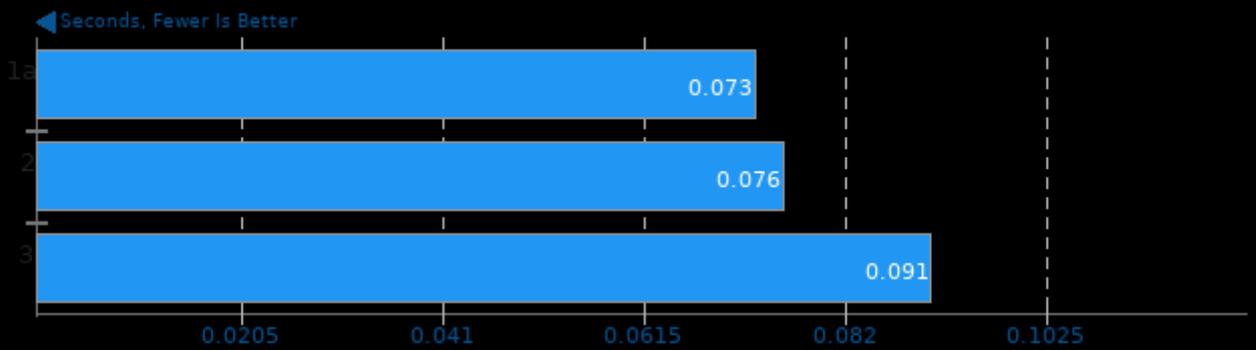
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numba - Project Size: 262144 - Benchmark: Isonutral Mixing



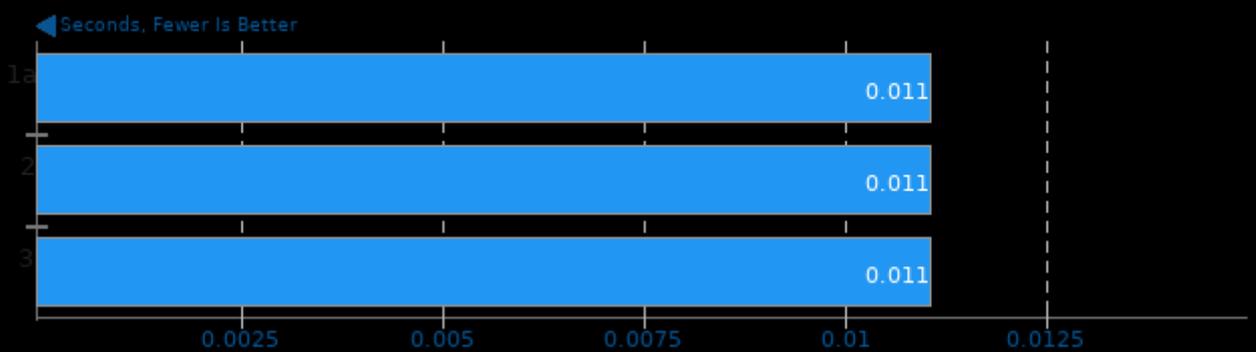
PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 4194304 - Benchmark: Equation of State



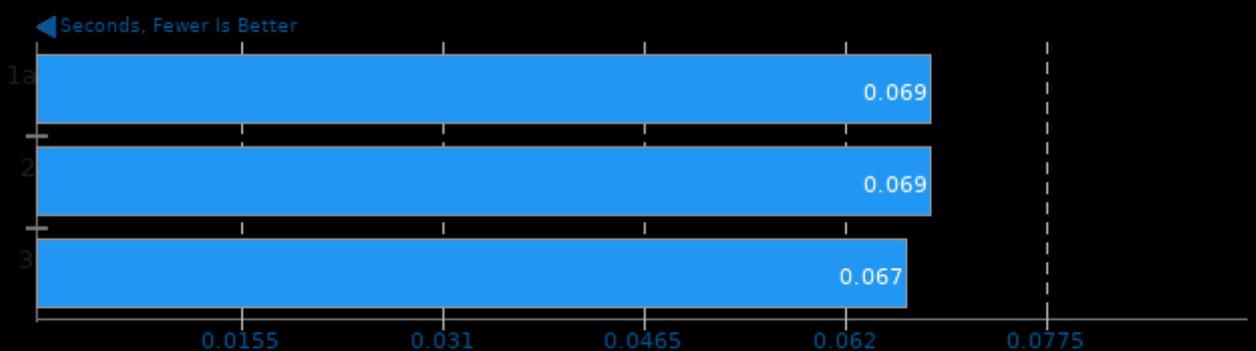
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 65536 - Benchmark: Equation of State



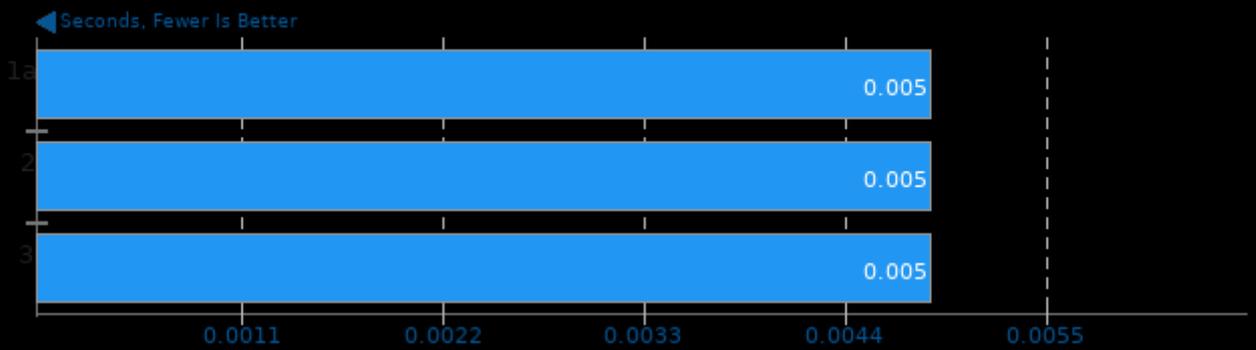
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 1048576 - Benchmark: Equation of State



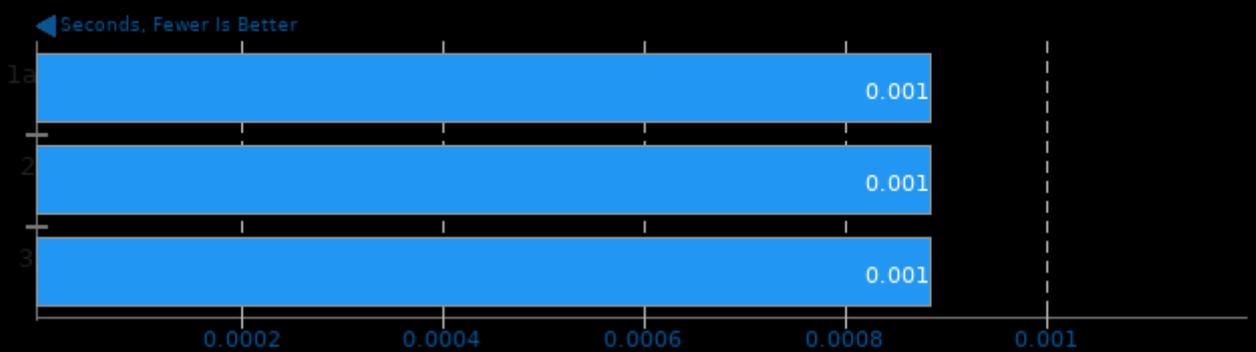
PyHPC Benchmarks 2.1

Device: CPU - Backend: TensorFlow - Project Size: 262144 - Benchmark: Equation of State



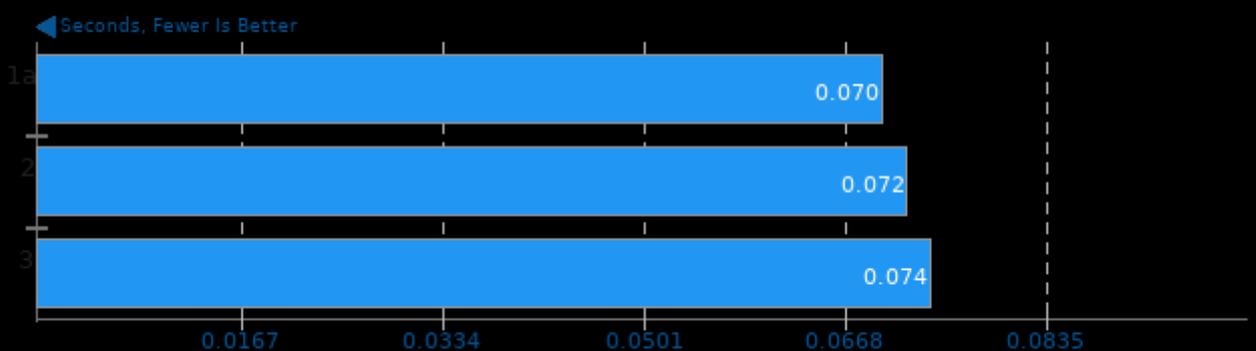
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numba - Project Size: 16384 - Benchmark: Equation of State



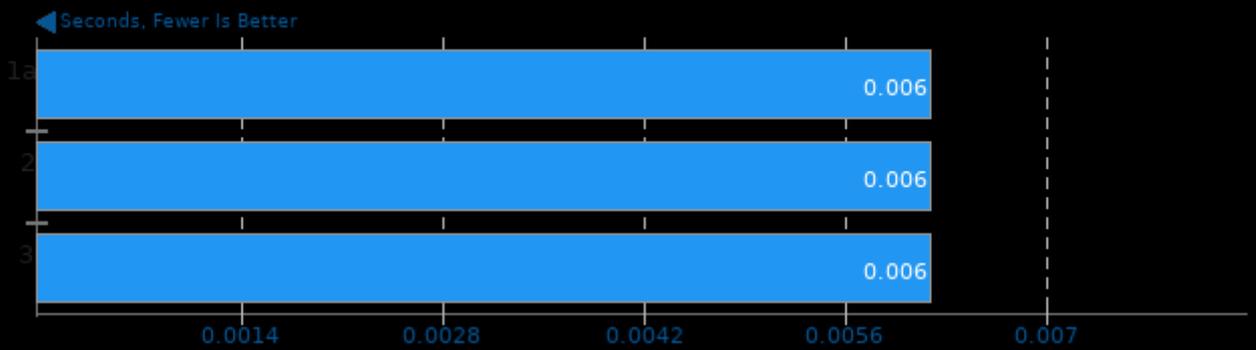
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 1048576 - Benchmark: Equation of State



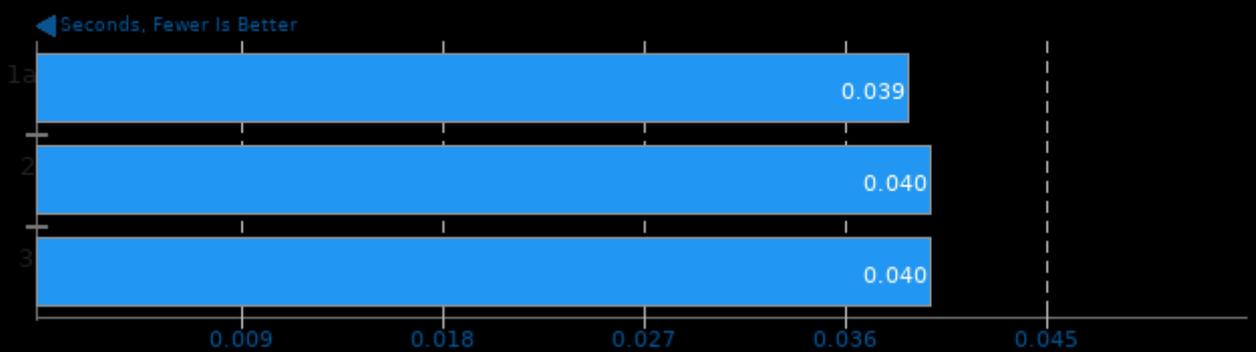
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 16384 - Benchmark: Isonutral Mixing



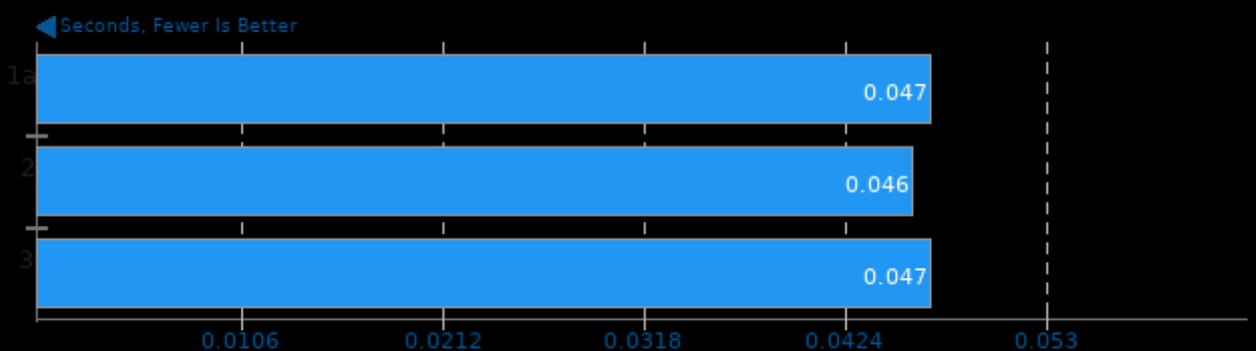
PyHPC Benchmarks 2.1

Device: CPU - Backend: Bohrium - Project Size: 65536 - Benchmark: Isonutral Mixing



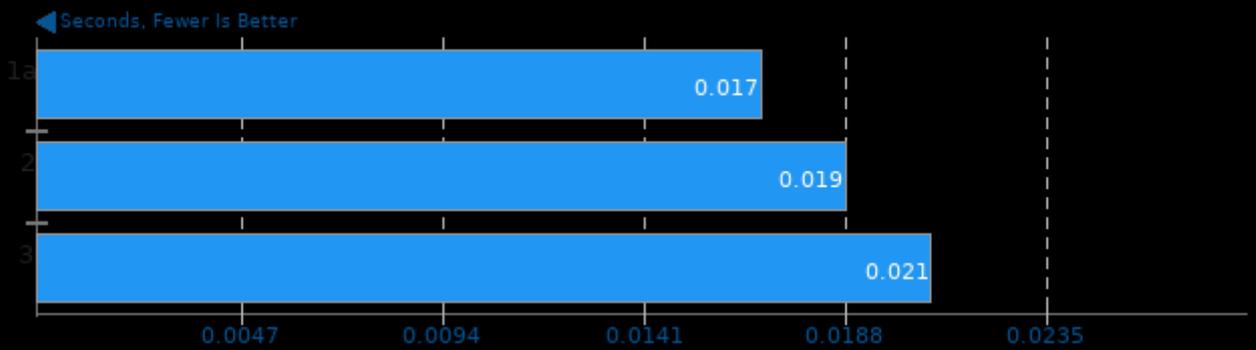
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numba - Project Size: 1048576 - Benchmark: Equation of State



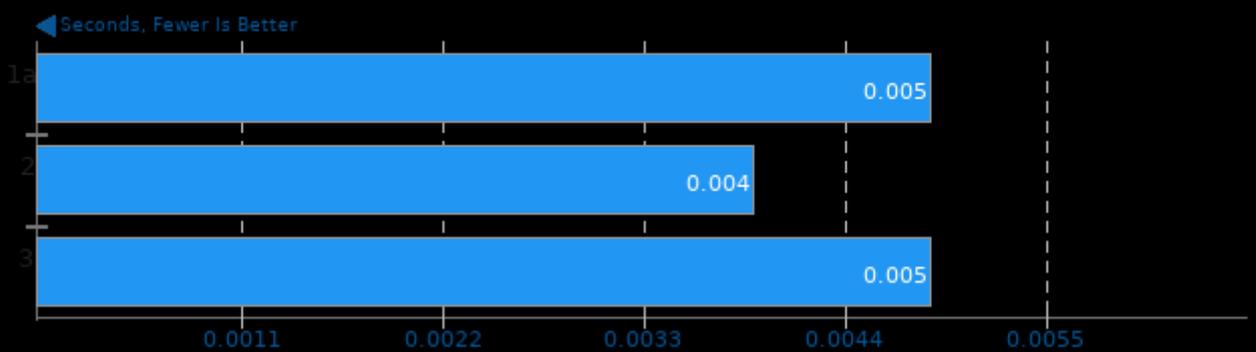
PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 1048576 - Benchmark: Equation of State



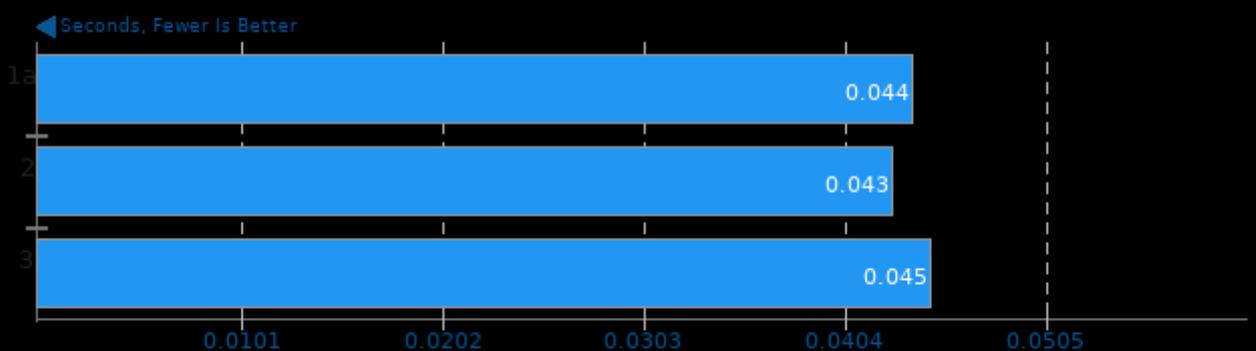
PyHPC Benchmarks 2.1

Device: CPU - Backend: Theano - Project Size: 65536 - Benchmark: Equation of State



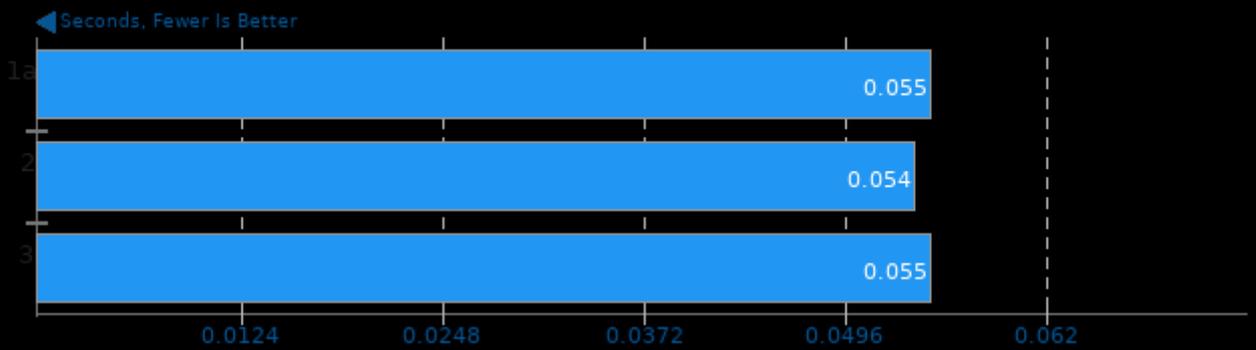
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 262144 - Benchmark: Equation of State



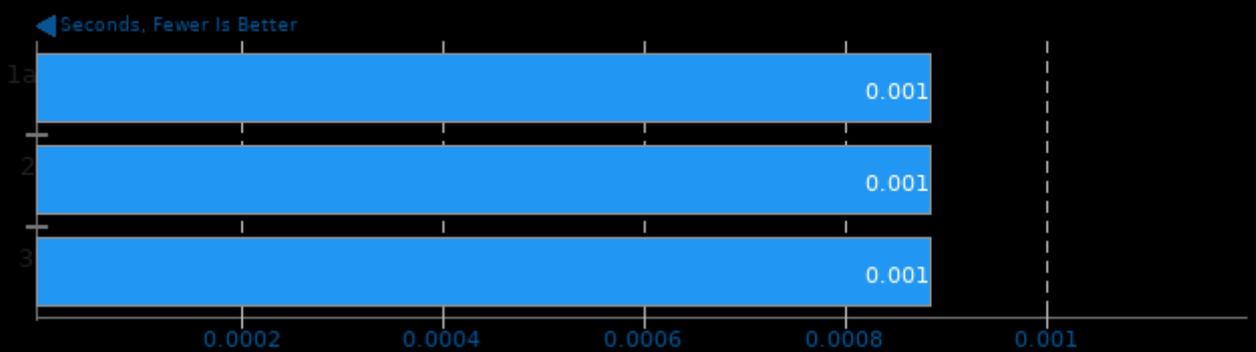
PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 262144 - Benchmark: Isonutral Mixing



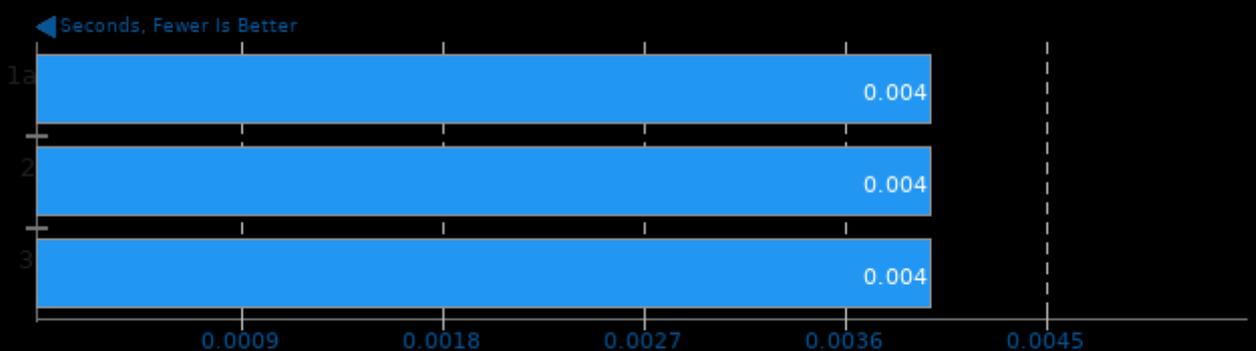
PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 65536 - Benchmark: Equation of State



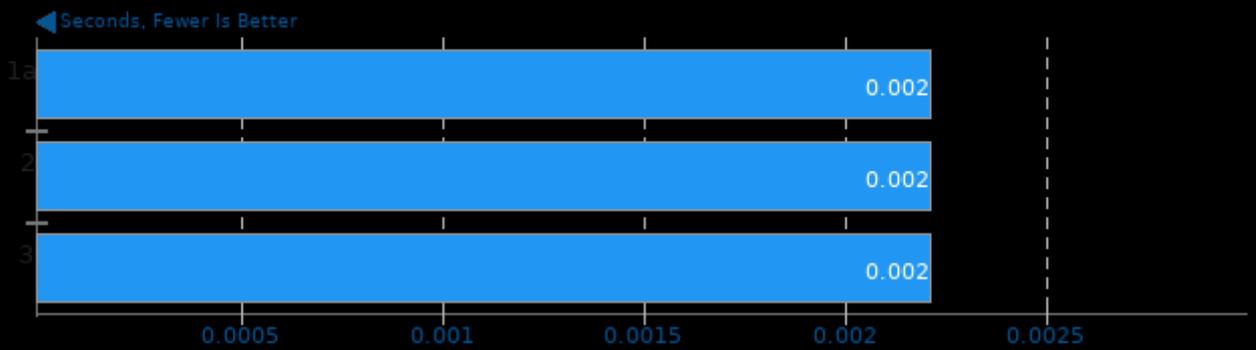
PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 262144 - Benchmark: Equation of State



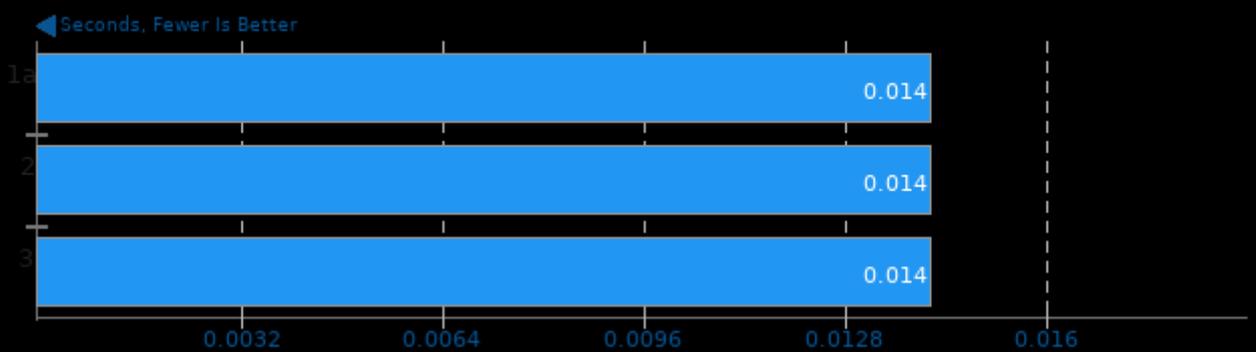
PyHPC Benchmarks 2.1

Device: CPU - Backend: Numpy - Project Size: 16384 - Benchmark: Equation of State



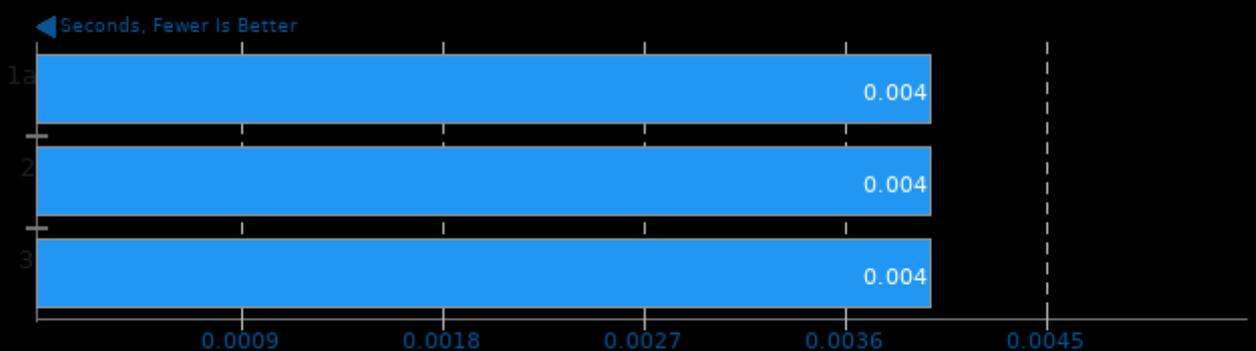
PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 65536 - Benchmark: Isonutral Mixing



PyHPC Benchmarks 2.1

Device: CPU - Backend: PyTorch - Project Size: 16384 - Benchmark: Isonutral Mixing



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