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## pyHPC 4500U Ryzen

AMD Ryzen 5 4500U testing with a LENOVO LNVNB161216 (EECN20WW BIOS) and AMD Renoir on Ubuntu 21.10 via the Phoronix Test Suite.

### Automated Executive Summary

1 had the most wins, coming in first place for 77% of the tests.

Based on the geometric mean of all complete results, the fastest (3) was 1.008x the speed of the slowest (1). 2 was 0.994x the speed of 3 and 1 was 0.998x the speed of 2.

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

PyHPC Benchmarks (Device: CPU - Backend: Numba - Project Size: 65536 - Benchmark: Equation of State) at 1.25x  
PyHPC Benchmarks (Device: CPU - Backend: PyTorch - Project Size: 262144 - Benchmark: Equation of State) at 1.2x  
PyHPC Benchmarks (Device: CPU - Backend: PyTorch - Project Size: 1048576 - Benchmark: Equation of State) at 1.13x  
PyHPC Benchmarks (Device: CPU - Backend: JAX - Project Size: 4194304 - Benchmark: Isoneutral Mixing) at 1.091x  
PyHPC Benchmarks (Device: CPU - Backend: JAX - Project Size: 262144 - Benchmark: Isoneutral Mixing) at 1.058x  
PyHPC Benchmarks (Device: CPU - Backend: TensorFlow - Project Size: 262144 - Benchmark: Equation of State) at 1.056x  
PyHPC Benchmarks (Device: CPU - Backend: Numpy - Project Size: 65536 - Benchmark: Equation of State) at 1.048x

PyHPC Benchmarks (Device: CPU - Backend: JAX - Project Size: 65536 - Benchmark: Isoneutral Mixing) at 1.038x  
PyHPC Benchmarks (Device: CPU - Backend: TensorFlow - Project Size: 4194304 - Benchmark: Equation of State) at 1.034x  
PyHPC Benchmarks (Device: CPU - Backend: TensorFlow - Project Size: 1048576 - Benchmark: Equation of State) at 1.028x.

## Test Systems:

### 1

Processor: AMD Ryzen 5 4500U @ 2.38GHz (6 Cores), Motherboard: LENOVO LNVNB161216 (EECN20WW BIOS), Chipset: AMD Renoir/Cezanne, Memory: 16GB, Disk: 256GB SK hynix HFM256GDHTNI-87A0B, Graphics: AMD Renoir (1500/400MHz), Audio: AMD Renoir Radeon HD Audio, Network: Realtek RTL8822CE 802.11ac PCIe

OS: Ubuntu 21.10, Kernel: 5.13.0-20-generic (x86\_64), Desktop: GNOME Shell 40.5, Display Server: X Server + Wayland, Vulkan: 1.2.182, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise  
Processor Notes: Scaling Governor: acpi-cpufreq schedutil (Boost: Enabled) - Platform Profile: balanced - CPU Microcode: 0x8600102 - ACPI Profile: balanced  
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: disabled RSB filling + srbs: Not affected + tsx\_async\_abort: Not affected

### 2

### 3

Processor: AMD Ryzen 5 4500U @ 2.38GHz (6 Cores), Motherboard: LENOVO LNVNB161216 (EECN20WW BIOS), Chipset: AMD Renoir/Cezanne, Memory: 16GB, Disk: 256GB SK hynix HFM256GDHTNI-87A0B, Graphics: AMD Renoir (1500/400MHz), Audio: AMD Renoir Radeon HD Audio, Network: Realtek RTL8822CE 802.11ac PCIe

OS: Ubuntu 21.10, Kernel: 5.13.0-20-generic (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: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise  
Processor Notes: Scaling Governor: acpi-cpufreq schedutil (Boost: Enabled) - Platform Profile: balanced - CPU Microcode: 0x8600102 - ACPI Profile: balanced  
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: disabled RSB filling + srbs: Not affected + tsx\_async\_abort: Not affected

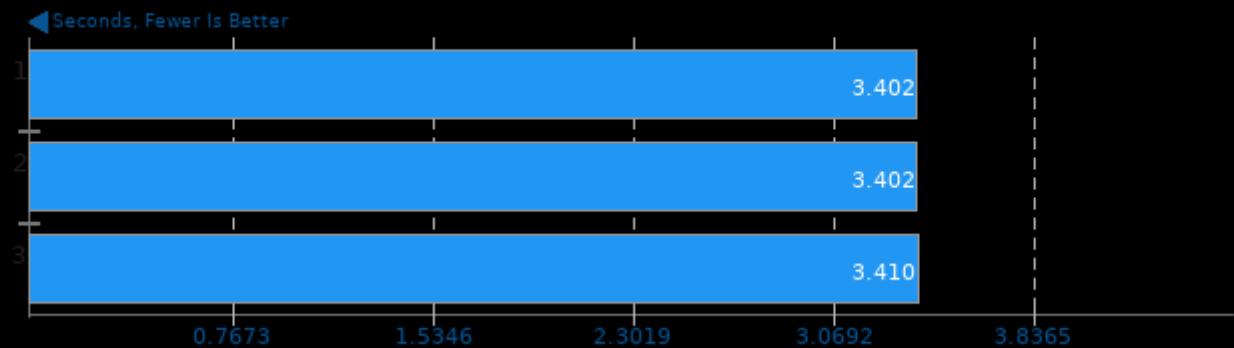
|   |              |              |              |
|---|--------------|--------------|--------------|
| PyHPC Benchmarks - CPU - Numpy -          | <b>3.402</b> | <b>3.402</b> | <b>3.41</b>  |
| 4194304 - Isoneutral Mixing (sec)         |              |              |              |
| Normalized                                | 100%         | 100%         | 99.77%       |
| PyHPC Benchmarks - CPU - PyTorch -        | 2.208        | <b>2.238</b> | <b>2.19</b>  |
| 4194304 - Isoneutral Mixing (sec)         |              |              |              |
| Normalized                                | 99.18%       | 97.86%       | 100%         |
| PyHPC Benchmarks - CPU - Theano -         | <b>1.927</b> | <b>1.936</b> | <b>1.927</b> |
| 4194304 - Isoneutral Mixing (sec)         |              |              |              |
| Normalized                                | 100%         | 99.54%       | 100%         |
| PyHPC Benchmarks - CPU - JAX - 4194304 -  | 1.286        | <b>1.203</b> | <b>1.312</b> |
| Isoneutral Mixing (sec)                   |              |              |              |
| Normalized                                | 93.55%       | 100%         | 91.69%       |
| PyHPC Benchmarks - CPU - Numba -          | <b>1.287</b> | <b>1.287</b> | <b>1.288</b> |
| 4194304 - Isoneutral Mixing (sec)         |              |              |              |
| Normalized                                | 100%         | 100%         | 99.92%       |
| PyHPC Benchmarks - CPU - Numpy -          | <b>2.116</b> | <b>2.118</b> | <b>2.118</b> |
| 4194304 - Equation of State (sec)         |              |              |              |
| Normalized                                | 100%         | 99.91%       | 99.91%       |
| PyHPC Benchmarks - CPU - Numba -          | <b>0.308</b> | <b>0.308</b> | <b>0.307</b> |
| 1048576 - Isoneutral Mixing (sec)         |              |              |              |
| Normalized                                | 99.68%       | 99.68%       | 100%         |
| PyHPC Benchmarks - CPU - JAX - 65536 -    | <b>0.026</b> | <b>0.026</b> | <b>0.027</b> |
| Isoneutral Mixing (sec)                   |              |              |              |
| Normalized                                | 100%         | 100%         | 96.3%        |
| PyHPC Benchmarks - CPU - Theano - 65536 - | 0.026        | 0.026        | 0.026        |
| Isoneutral Mixing (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - JAX - 1048576 -  | 0.025        | 0.025        | 0.025        |
| Equation of State (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - Numba -          | 0.268        | 0.268        | 0.268        |
| 4194304 - Equation of State (sec)         |              |              |              |
| PyHPC Benchmarks - CPU - TensorFlow -     | 0.002        | 0.002        | 0.002        |
| 16384 - Equation of State (sec)           |              |              |              |
| PyHPC Benchmarks - CPU - Theano - 16384 - | 0.006        | 0.006        | 0.006        |
| Isoneutral Mixing (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - Numba - 65536 -  | 0.018        | 0.018        | 0.018        |
| Isoneutral Mixing (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - Numpy -          | <b>0.859</b> | 0.86         | <b>0.866</b> |
| 1048576 - Isoneutral Mixing (sec)         |              |              |              |
| Normalized                                | 100%         | 99.88%       | 99.19%       |
| PyHPC Benchmarks - CPU - JAX - 65536 -    | 0.002        | 0.002        | 0.002        |
| Equation of State (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - JAX - 262144 -   | <b>0.138</b> | <b>0.146</b> | 0.143        |
| Isoneutral Mixing (sec)                   |              |              |              |
| Normalized                                | 100%         | 94.52%       | 96.5%        |
| PyHPC Benchmarks - CPU - TensorFlow -     | <b>0.019</b> | <b>0.019</b> | <b>0.018</b> |
| 262144 - Equation of State (sec)          |              |              |              |
| Normalized                                | 94.74%       | 94.74%       | 100%         |
| PyHPC Benchmarks - CPU - Numpy - 262144 - | <b>0.194</b> | <b>0.194</b> | <b>0.193</b> |
| - Isoneutral Mixing (sec)                 |              |              |              |
| Normalized                                | 99.48%       | 99.48%       | 100%         |

|   |              |              |              |
|---|--------------|--------------|--------------|
| PyHPC Benchmarks - CPU - TensorFlow -     | <b>0.15</b>  | 0.149        | <b>0.145</b> |
| 4194304 - Equation of State (sec)         |              |              |              |
| Normalized                                | 96.67%       | 97.32%       | 100%         |
| PyHPC Benchmarks - CPU - Theano -         | <b>0.466</b> | <b>0.47</b>  | 0.467        |
| 1048576 - Isoneutral Mixing (sec)         |              |              |              |
| Normalized                                | 100%         | 99.15%       | 99.79%       |
| PyHPC Benchmarks - CPU - Theano - 262144  | 0.021        | 0.021        | 0.021        |
| - Equation of State (sec)                 |              |              |              |
| PyHPC Benchmarks - CPU - PyTorch -        | 0.542        | <b>0.543</b> | <b>0.539</b> |
| 1048576 - Isoneutral Mixing (sec)         |              |              |              |
| Normalized                                | 99.45%       | 99.26%       | 100%         |
| PyHPC Benchmarks - CPU - Theano - 262144  | 0.111        | 0.111        | 0.111        |
| - Isoneutral Mixing (sec)                 |              |              |              |
| PyHPC Benchmarks - CPU - JAX - 1048576 -  | <b>0.375</b> | <b>0.375</b> | <b>0.376</b> |
| Isoneutral Mixing (sec)                   |              |              |              |
| Normalized                                | 100%         | 100%         | 99.73%       |
| PyHPC Benchmarks - CPU - JAX - 4194304 -  | <b>0.09</b>  | <b>0.092</b> | 0.091        |
| Equation of State (sec)                   |              |              |              |
| Normalized                                | 100%         | 97.83%       | 98.9%        |
| PyHPC Benchmarks - CPU - Theano - 16384 - | 0.001        | 0.001        | 0.001        |
| Equation of State (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - Numba - 262144   | 0.016        | 0.016        | 0.016        |
| - Equation of State (sec)                 |              |              |              |
| PyHPC Benchmarks - CPU - PyTorch -        | 0.095        | 0.095        | 0.095        |
| 4194304 - Equation of State (sec)         |              |              |              |
| PyHPC Benchmarks - CPU - Numba - 262144   | 0.067        | 0.067        | 0.067        |
| - Isoneutral Mixing (sec)                 |              |              |              |
| PyHPC Benchmarks - CPU - Numpy -          | <b>0.471</b> | <b>0.471</b> | <b>0.47</b>  |
| 1048576 - Equation of State (sec)         |              |              |              |
| Normalized                                | 99.79%       | 99.79%       | 100%         |
| PyHPC Benchmarks - CPU - Theano -         | <b>0.336</b> | <b>0.337</b> | <b>0.336</b> |
| 4194304 - Equation of State (sec)         |              |              |              |
| Normalized                                | 100%         | 99.7%        | 100%         |
| PyHPC Benchmarks - CPU - Numba - 16384 -  | 0.001        | 0.001        | 0.001        |
| Equation of State (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - Theano -         | 0.085        | 0.085        | 0.085        |
| 1048576 - Equation of State (sec)         |              |              |              |
| PyHPC Benchmarks - CPU - JAX - 16384 -    | 0.004        | 0.004        | 0.004        |
| Isoneutral Mixing (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - Numpy - 16384 -  | 0.009        | 0.009        | 0.009        |
| Isoneutral Mixing (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - Numpy - 262144   | 0.108        | 0.108        | 0.108        |
| - Equation of State (sec)                 |              |              |              |
| PyHPC Benchmarks - CPU - JAX - 262144 -   | 0.005        | 0.005        | 0.005        |
| Equation of State (sec)                   |              |              |              |
| PyHPC Benchmarks - CPU - PyTorch -        | <b>0.023</b> | <b>0.026</b> | 0.024        |
| 1048576 - Equation of State (sec)         |              |              |              |
| Normalized                                | 100%         | 88.46%       | 95.83%       |

|  |              |              |              |
|--|--------------|--------------|--------------|
| <b>PyHPC Benchmarks - CPU - TensorFlow - 65536 - Equation of State (sec)</b>   | 0.006        | 0.006        | 0.006        |
| <b>PyHPC Benchmarks - CPU - Numba - 1048576 - Equation of State (sec)</b>      | 0.067        | 0.067        | 0.067        |
| <b>PyHPC Benchmarks - CPU - TensorFlow - 1048576 - Equation of State (sec)</b> | <b>0.037</b> | <b>0.036</b> | <b>0.036</b> |
| Normalized   | 97.3%        | 100%         | 100%         |
| <b>PyHPC Benchmarks - CPU - Numba - 16384 - Isoneutral Mixing (sec)</b>        | 0.004        | 0.004        | 0.004        |
| <b>PyHPC Benchmarks - CPU - Theano - 65536 - Equation of State (sec)</b>       | 0.006        | 0.006        | 0.006        |
| <b>PyHPC Benchmarks - CPU - Numpy - 65536 - Isoneutral Mixing (sec)</b>        | 0.045        | 0.045        | 0.045        |
| <b>PyHPC Benchmarks - CPU - PyTorch - 65536 - Equation of State (sec)</b>      | 0.002        | 0.002        | 0.002        |
| <b>PyHPC Benchmarks - CPU - PyTorch - 262144 - Isoneutral Mixing (sec)</b>     | <b>0.118</b> | <b>0.119</b> | <b>0.118</b> |
| Normalized   | 100%         | 99.16%       | 100%         |
| <b>PyHPC Benchmarks - CPU - PyTorch - 262144 - Equation of State (sec)</b>     | <b>0.006</b> | <b>0.006</b> | <b>0.005</b> |
| Normalized   | 83.33%       | 83.33%       | 100%         |
| <b>PyHPC Benchmarks - CPU - Numba - 65536 - Equation of State (sec)</b>        | <b>0.005</b> | <b>0.004</b> | <b>0.004</b> |
| Normalized   | 80%          | 100%         | 100%         |
| <b>PyHPC Benchmarks - CPU - Numpy - 16384 - Equation of State (sec)</b>        | 0.004        | 0.004        | 0.004        |
| <b>PyHPC Benchmarks - CPU - PyTorch - 65536 - Isoneutral Mixing (sec)</b>      | 0.026        | 0.026        | 0.026        |
| <b>PyHPC Benchmarks - CPU - Numpy - 65536 - Equation of State (sec)</b>        | <b>0.022</b> | <b>0.021</b> | <b>0.021</b> |
| Normalized   | 95.45%       | 100%         | 100%         |
| <b>PyHPC Benchmarks - CPU - PyTorch - 16384 - Isoneutral Mixing (sec)</b>      | 0.006        | 0.006        | 0.006        |

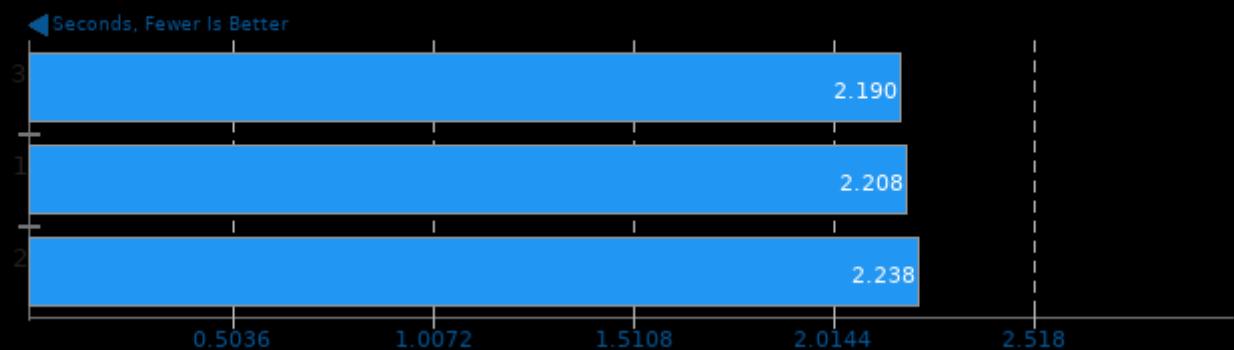
## PyHPC Benchmarks 2.1

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



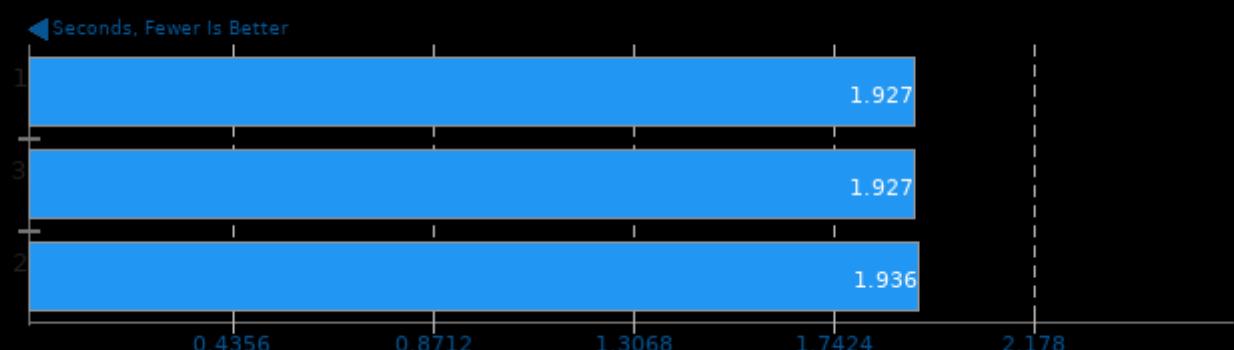
## PyHPC Benchmarks 2.1

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



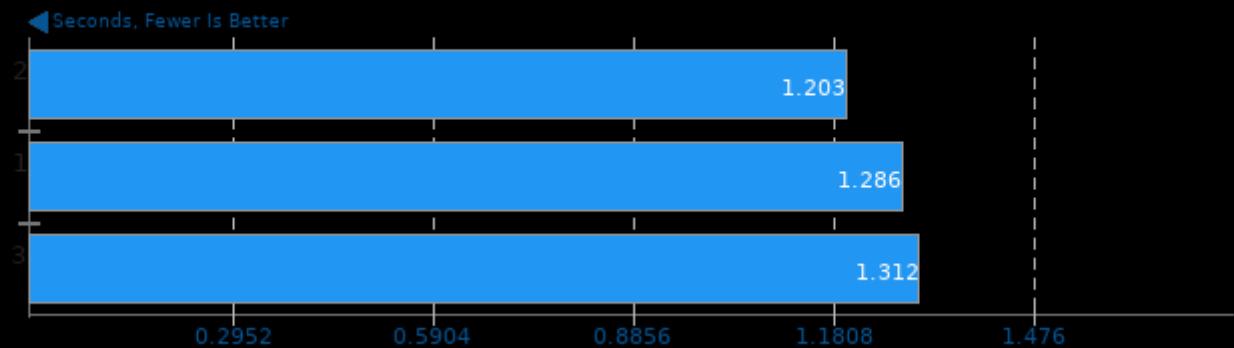
## PyHPC Benchmarks 2.1

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



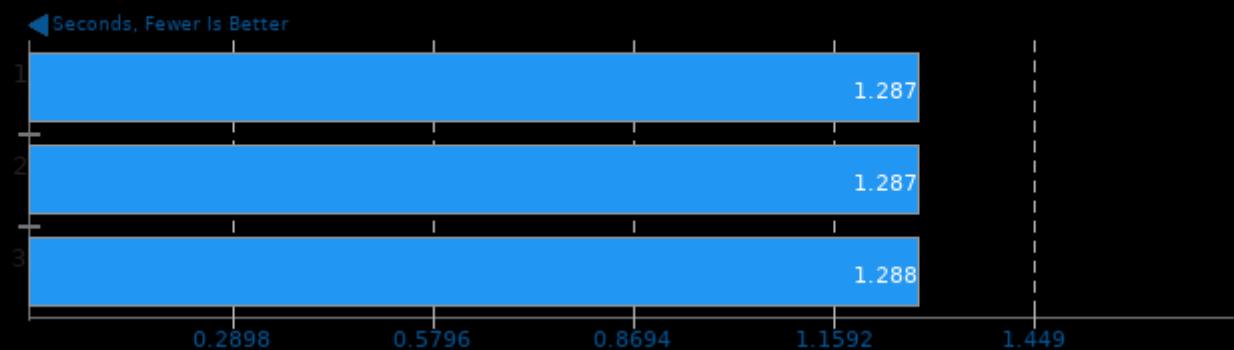
## PyHPC Benchmarks 2.1

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



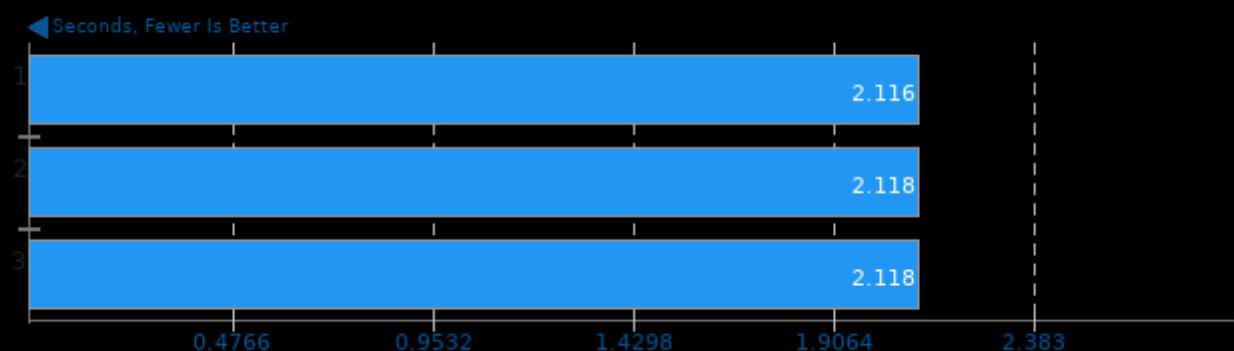
## PyHPC Benchmarks 2.1

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



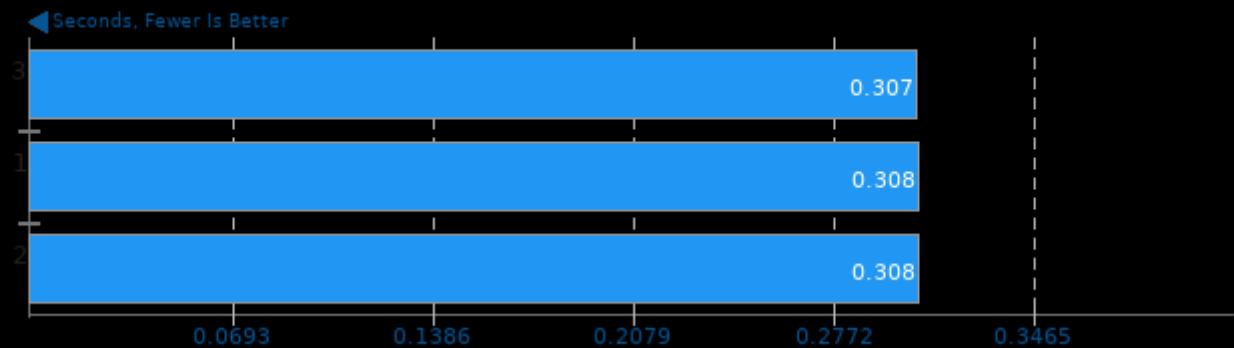
## PyHPC Benchmarks 2.1

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



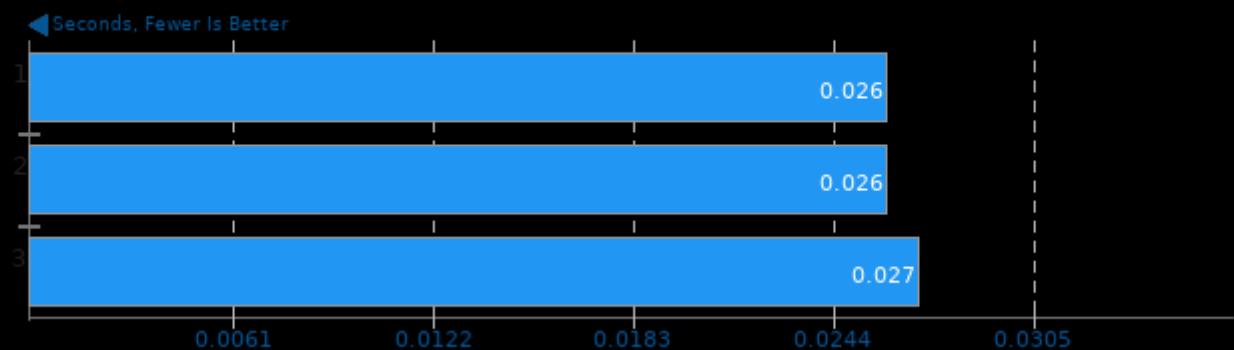
## PyHPC Benchmarks 2.1

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



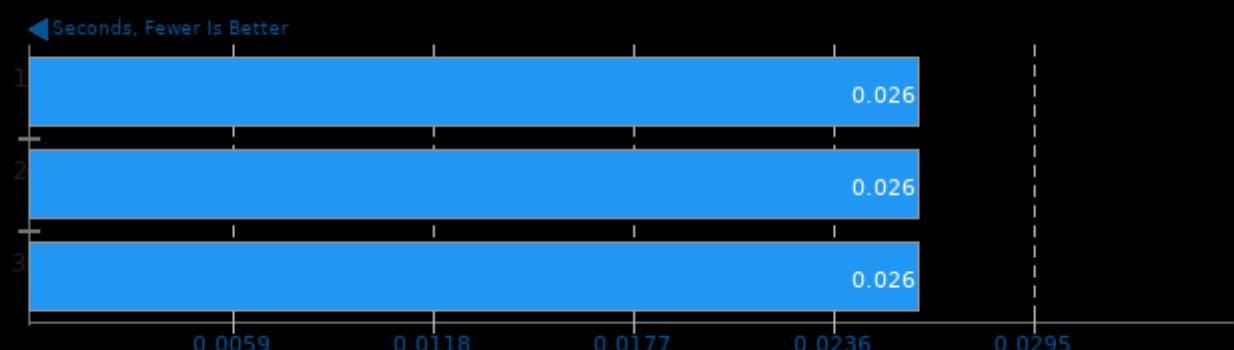
## PyHPC Benchmarks 2.1

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



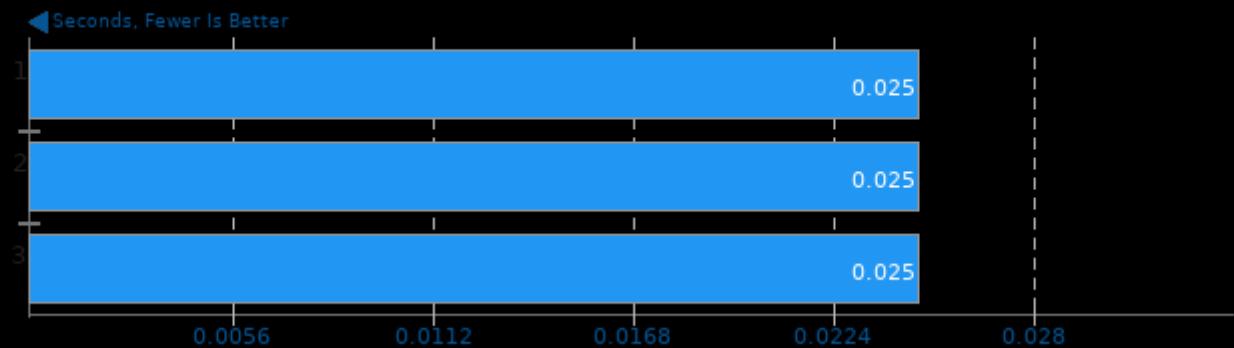
## PyHPC Benchmarks 2.1

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



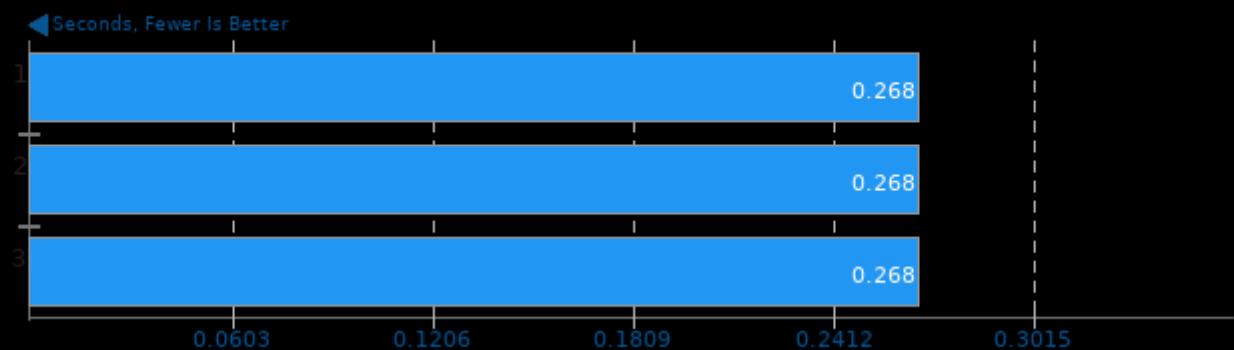
## PyHPC Benchmarks 2.1

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



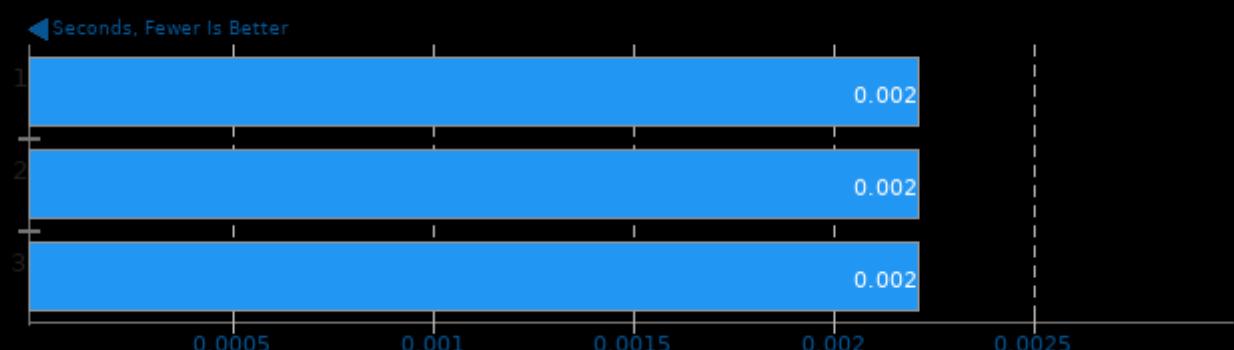
## PyHPC Benchmarks 2.1

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



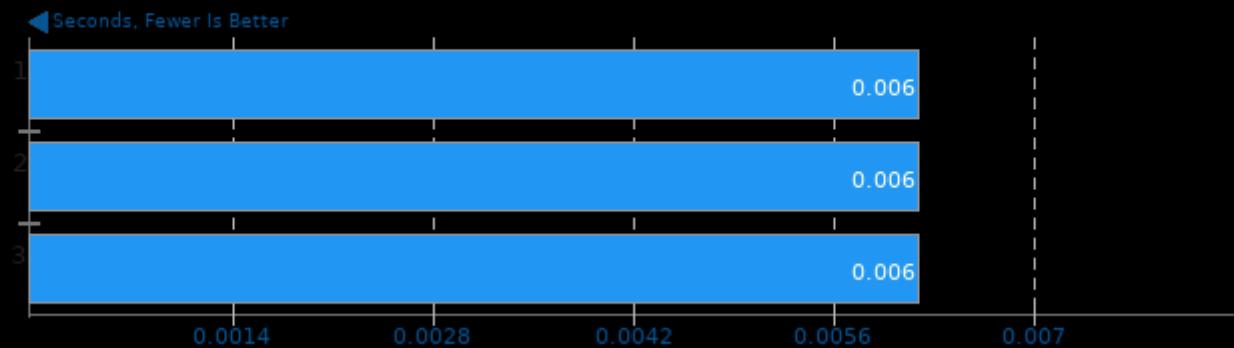
## PyHPC Benchmarks 2.1

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



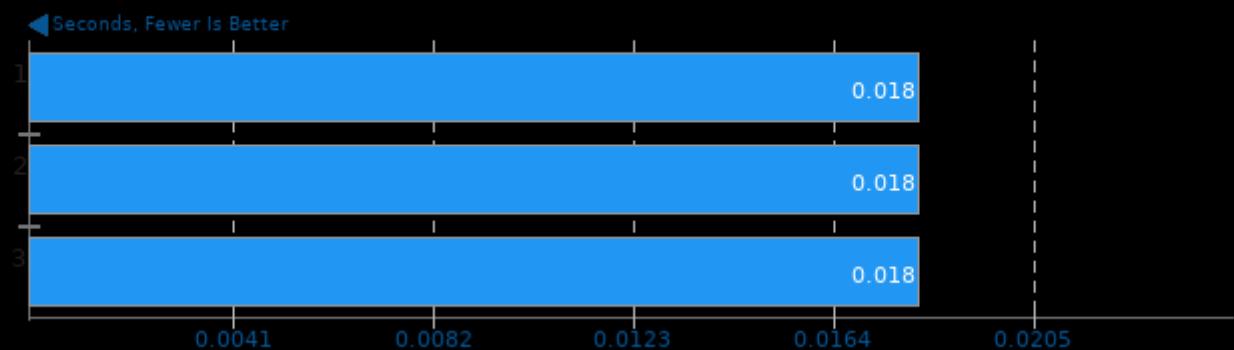
## PyHPC Benchmarks 2.1

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



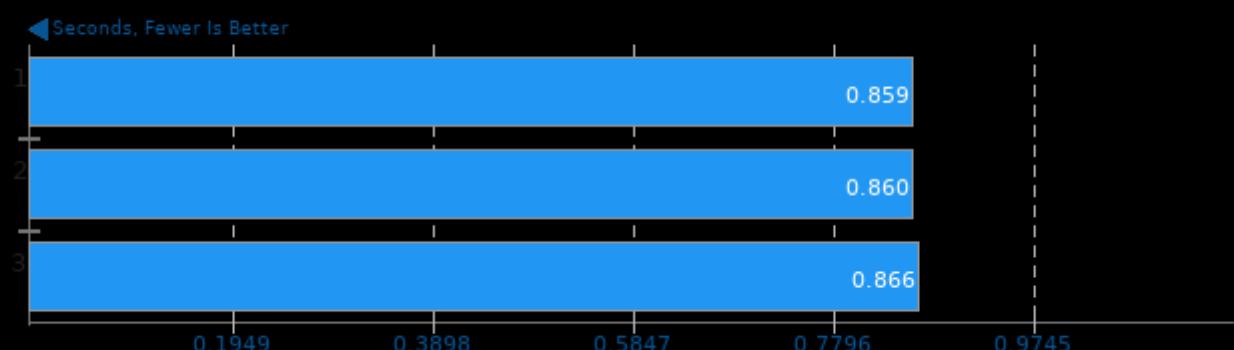
## PyHPC Benchmarks 2.1

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



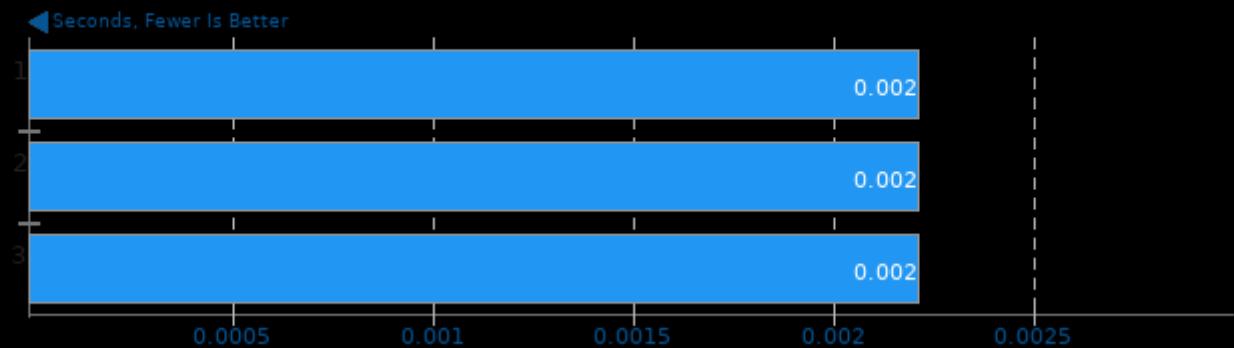
## PyHPC Benchmarks 2.1

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



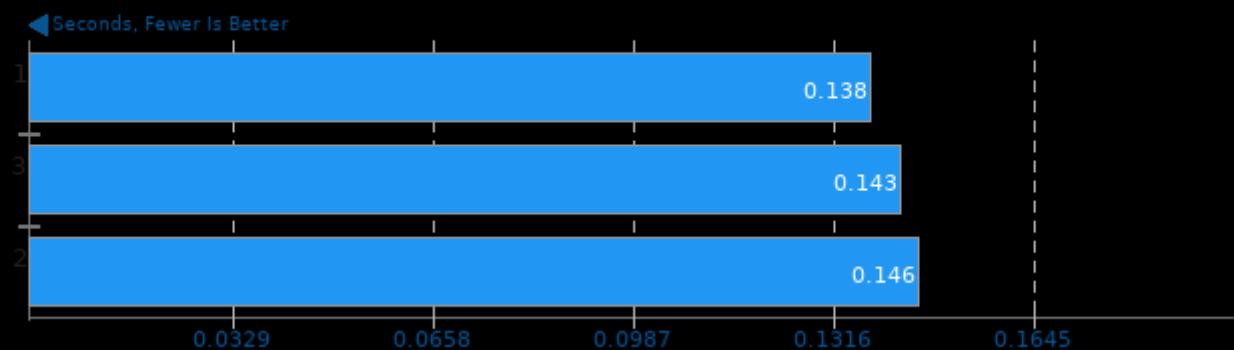
## PyHPC Benchmarks 2.1

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



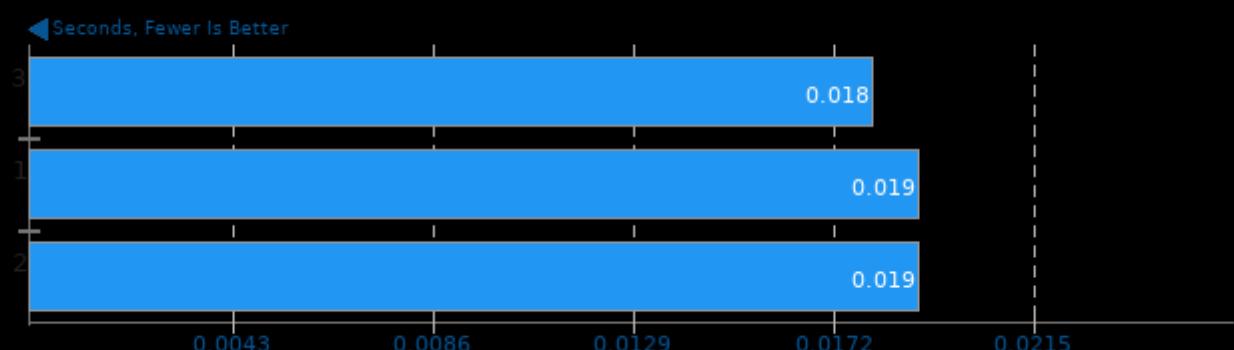
## PyHPC Benchmarks 2.1

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



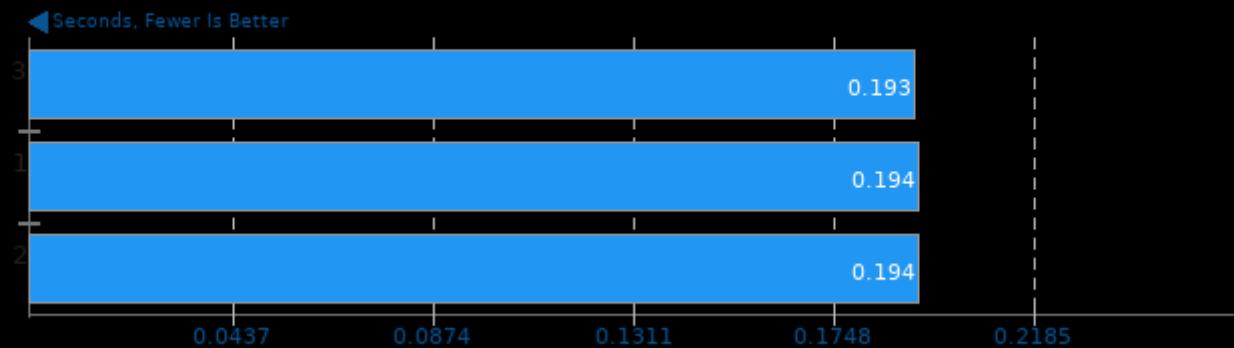
## PyHPC Benchmarks 2.1

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



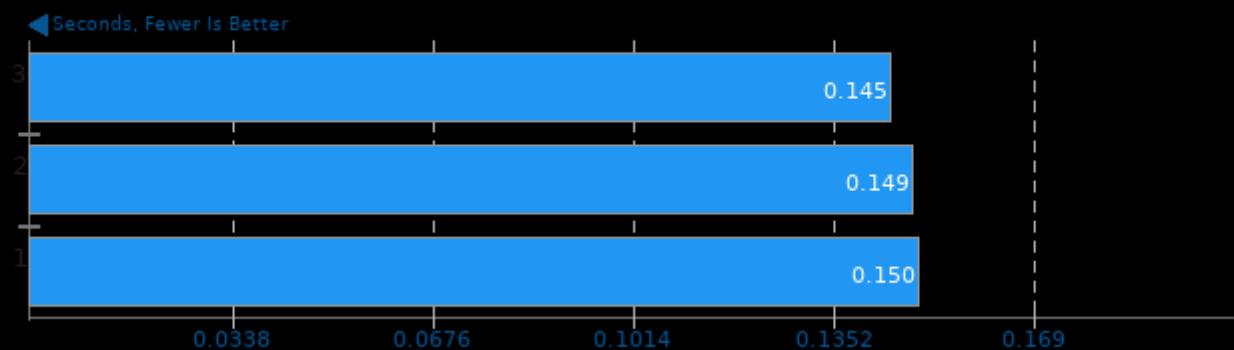
## PyHPC Benchmarks 2.1

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



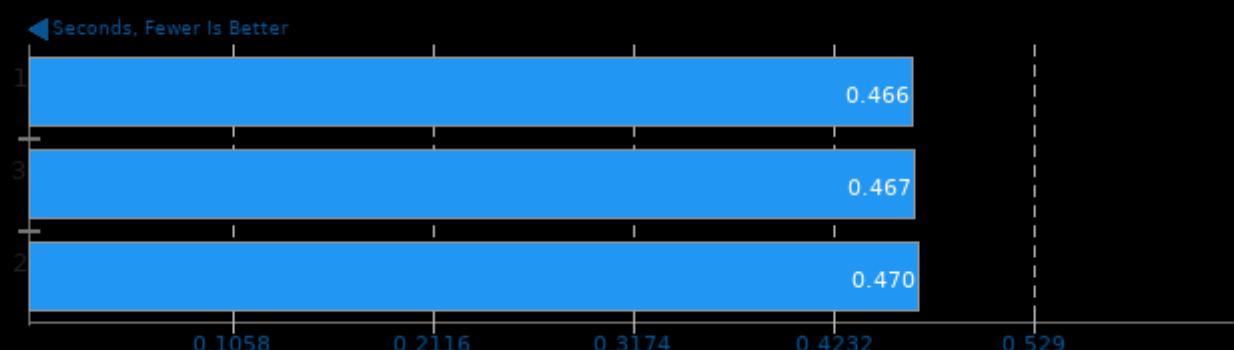
## PyHPC Benchmarks 2.1

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



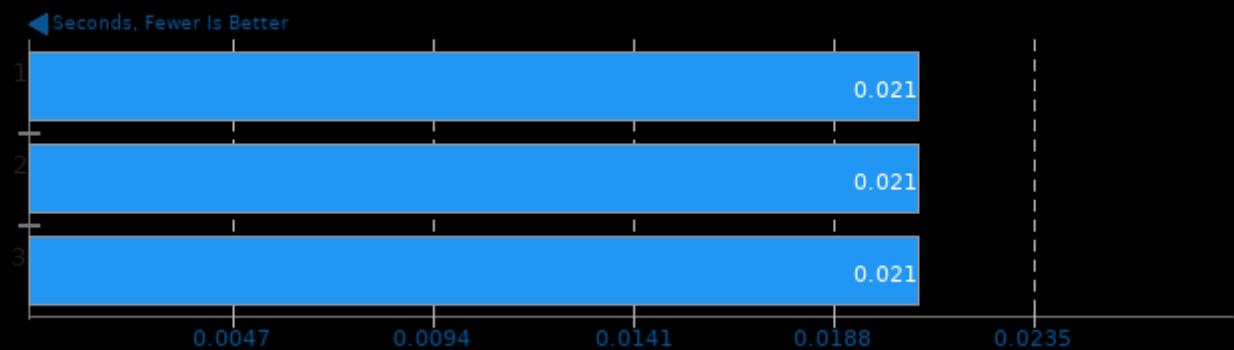
## PyHPC Benchmarks 2.1

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



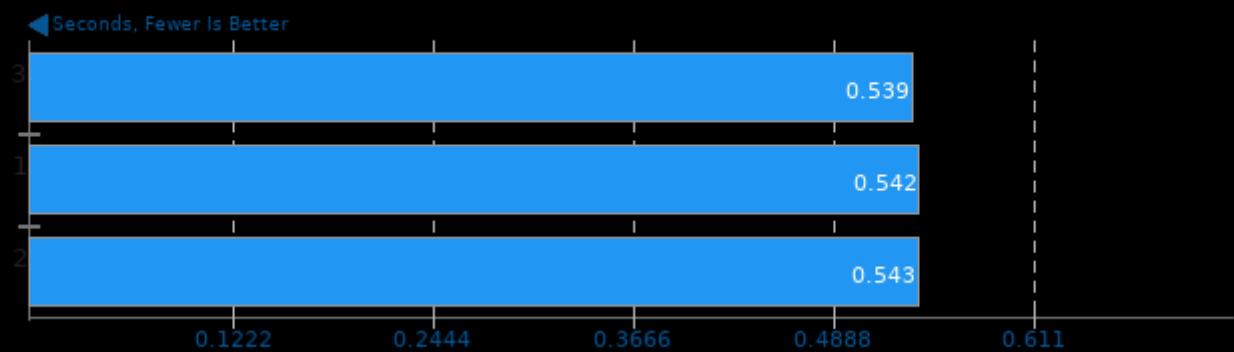
## PyHPC Benchmarks 2.1

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



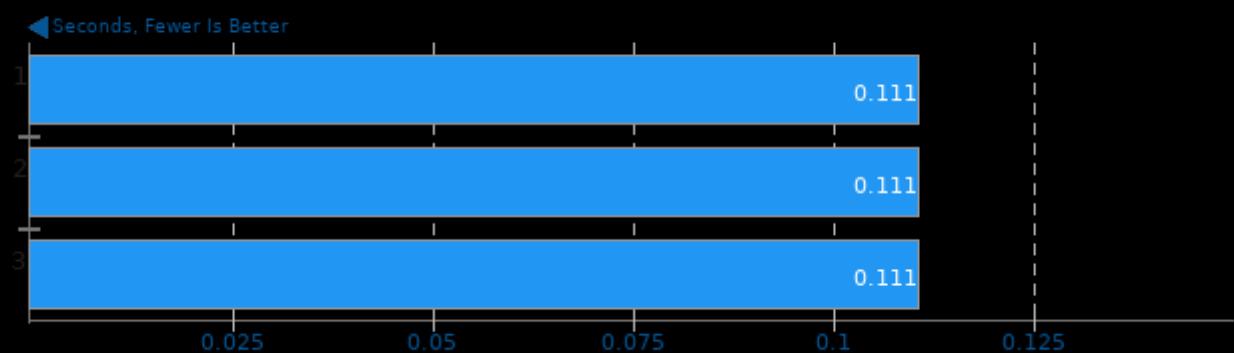
## PyHPC Benchmarks 2.1

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



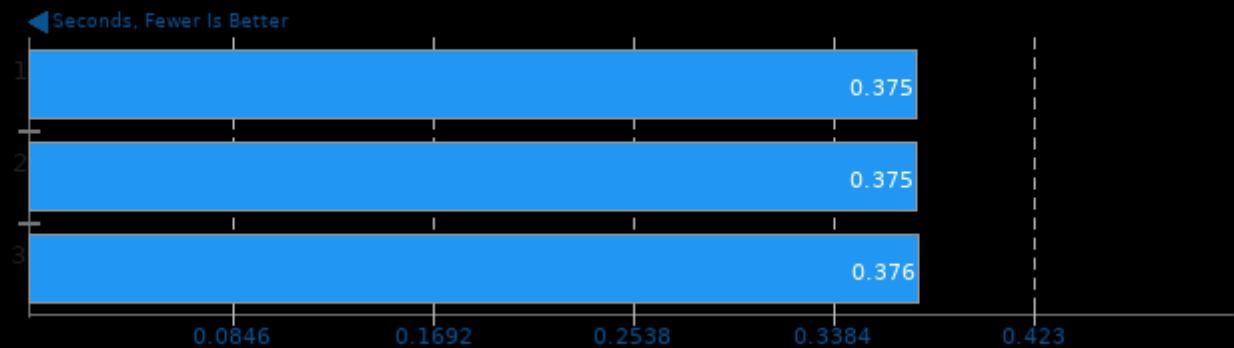
## PyHPC Benchmarks 2.1

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



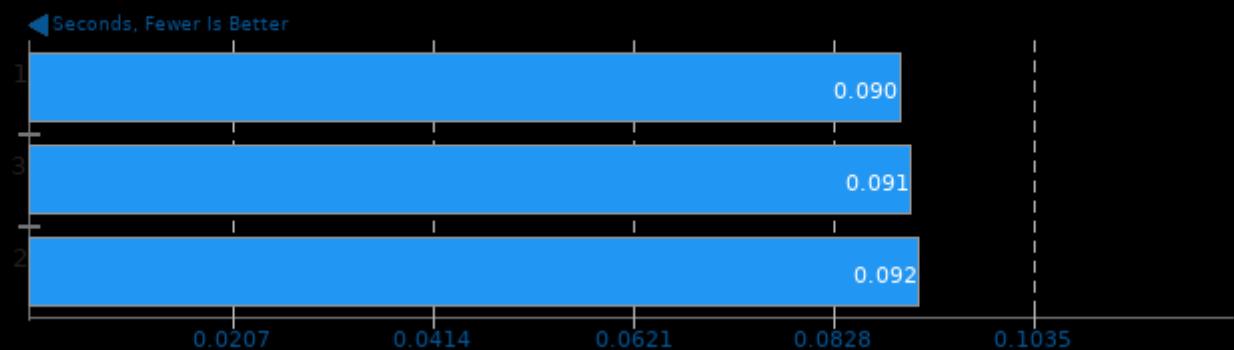
## PyHPC Benchmarks 2.1

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



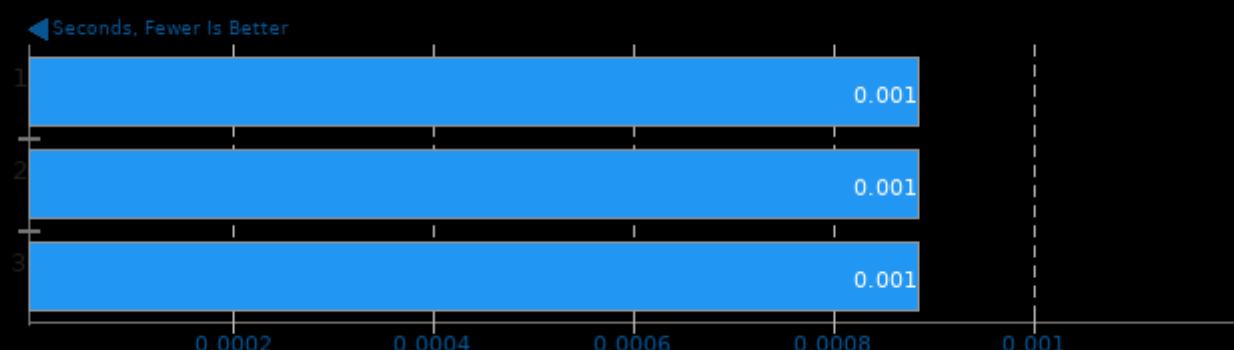
## PyHPC Benchmarks 2.1

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



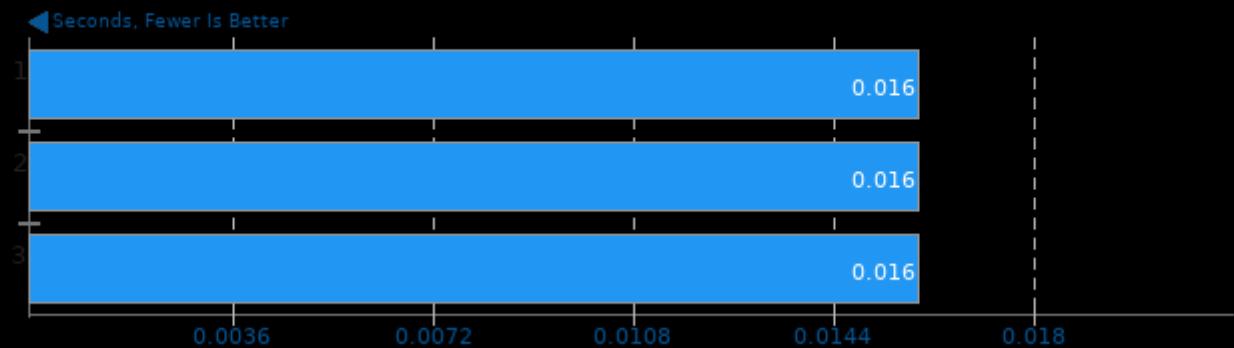
## PyHPC Benchmarks 2.1

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



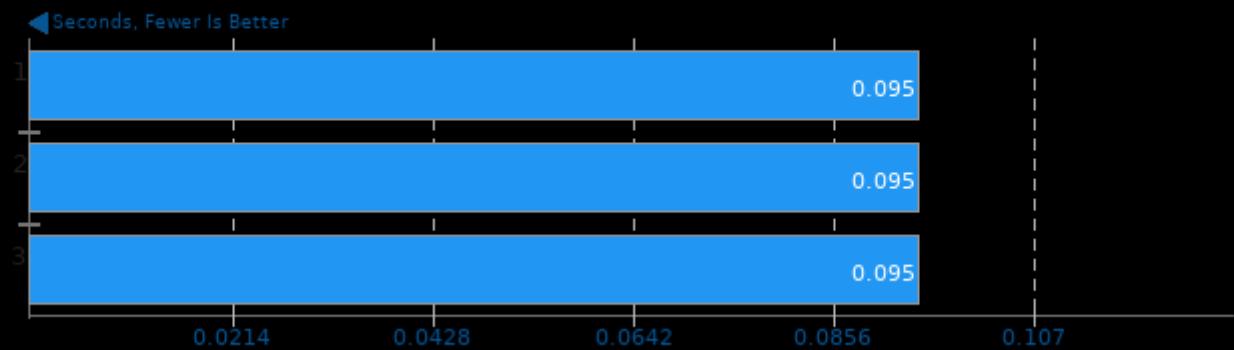
## PyHPC Benchmarks 2.1

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



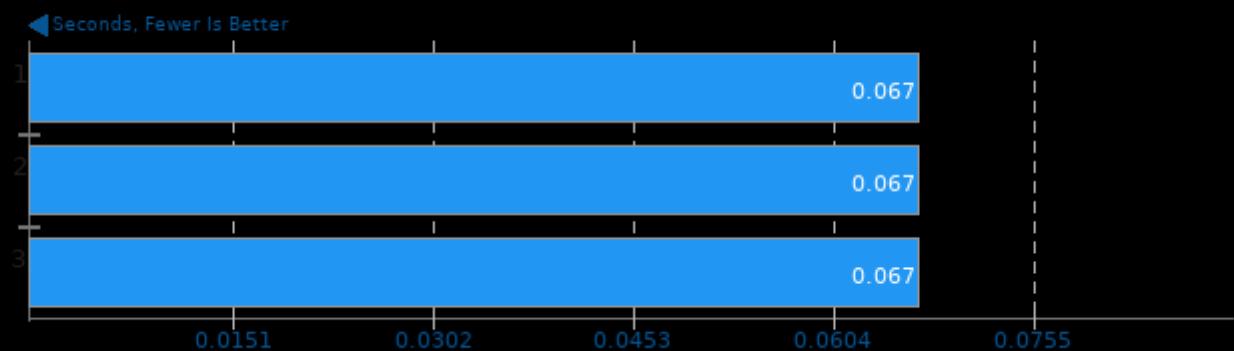
## PyHPC Benchmarks 2.1

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



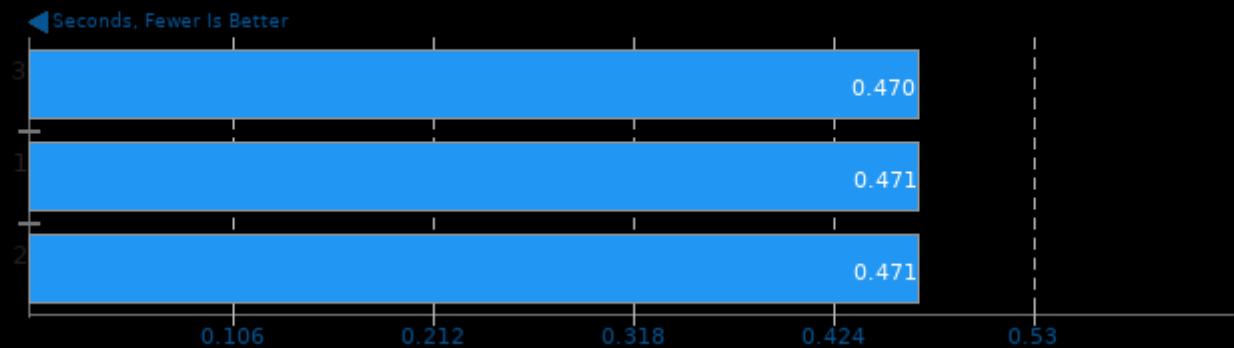
## PyHPC Benchmarks 2.1

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



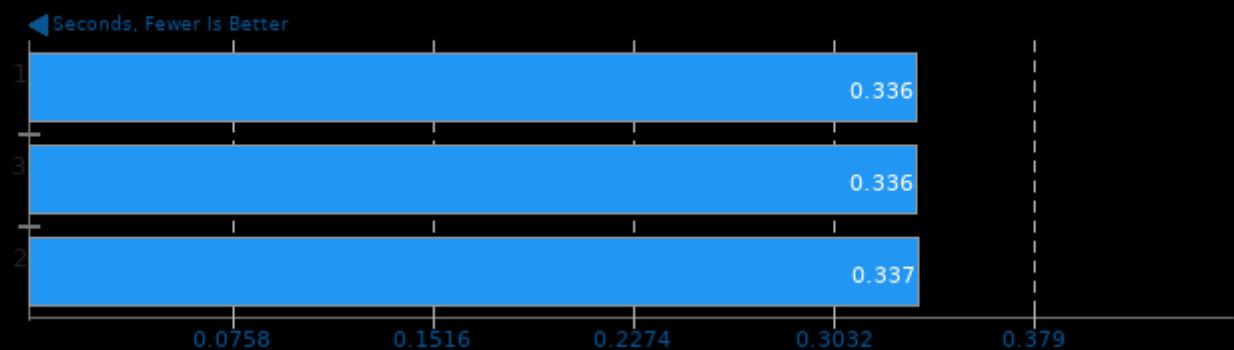
## PyHPC Benchmarks 2.1

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



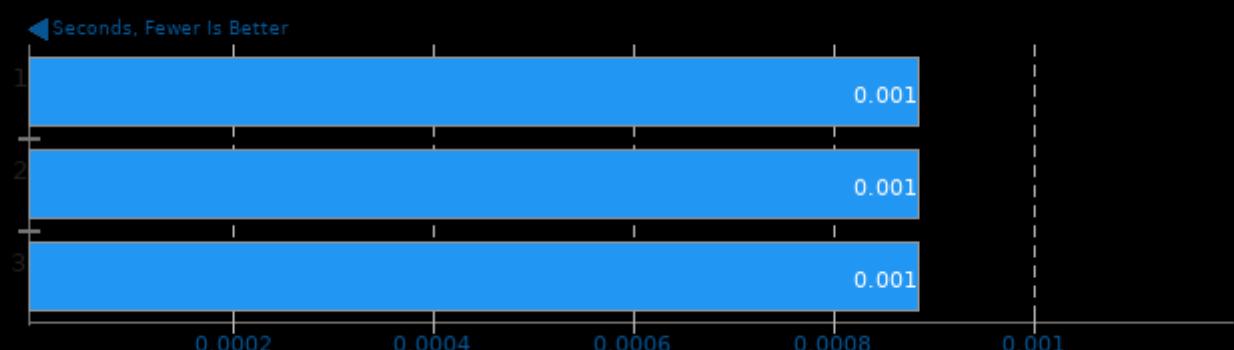
## PyHPC Benchmarks 2.1

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



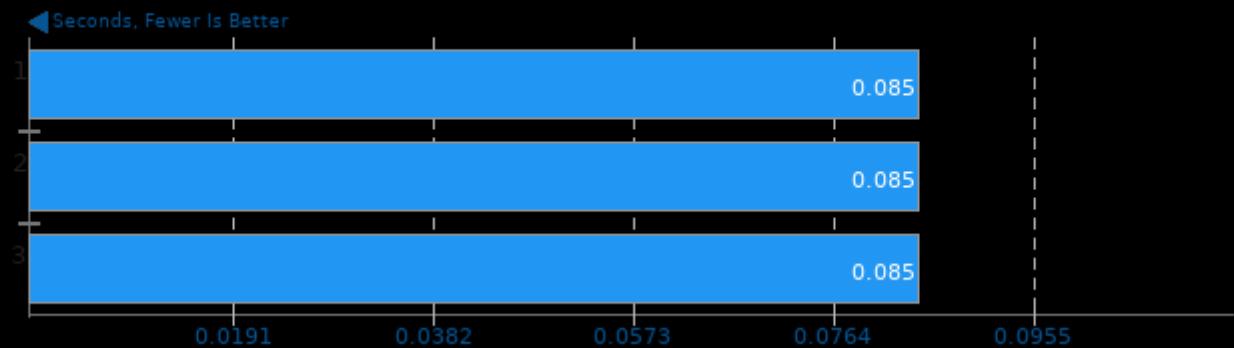
## PyHPC Benchmarks 2.1

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



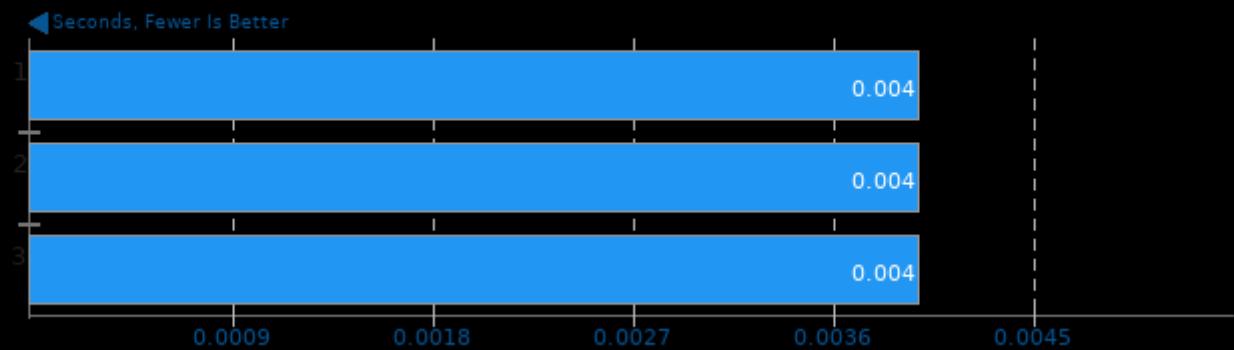
## PyHPC Benchmarks 2.1

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



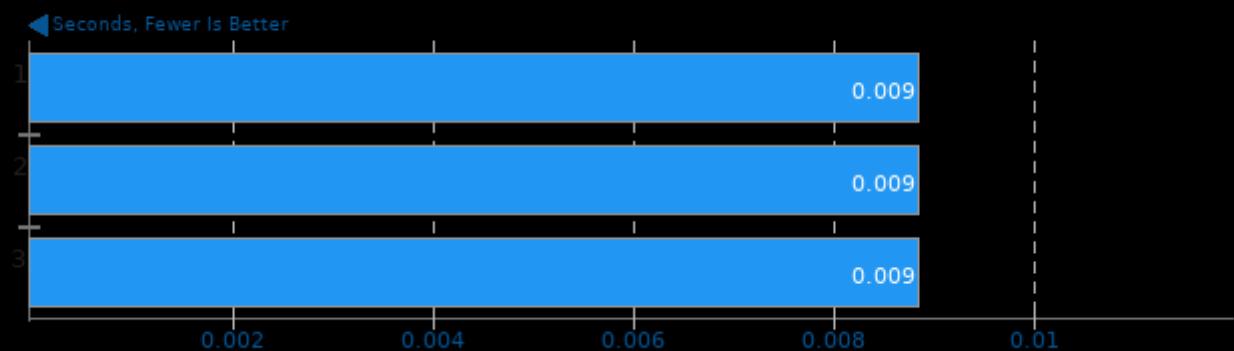
## PyHPC Benchmarks 2.1

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



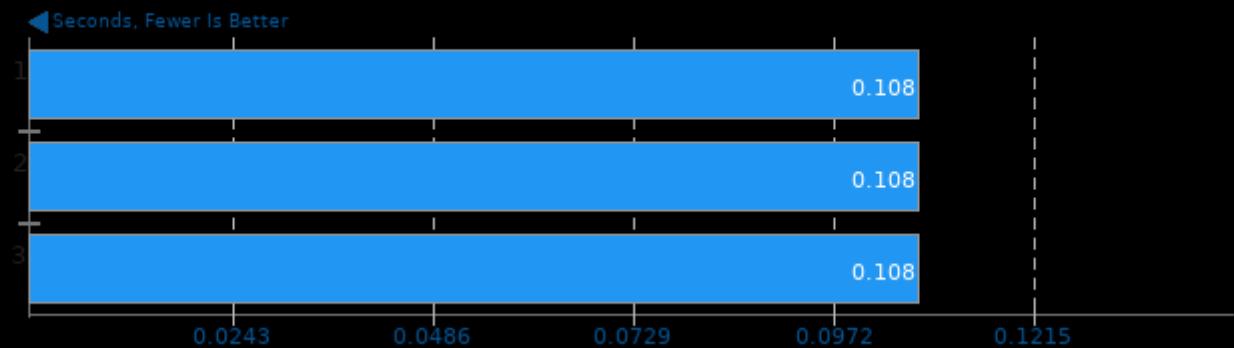
## PyHPC Benchmarks 2.1

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



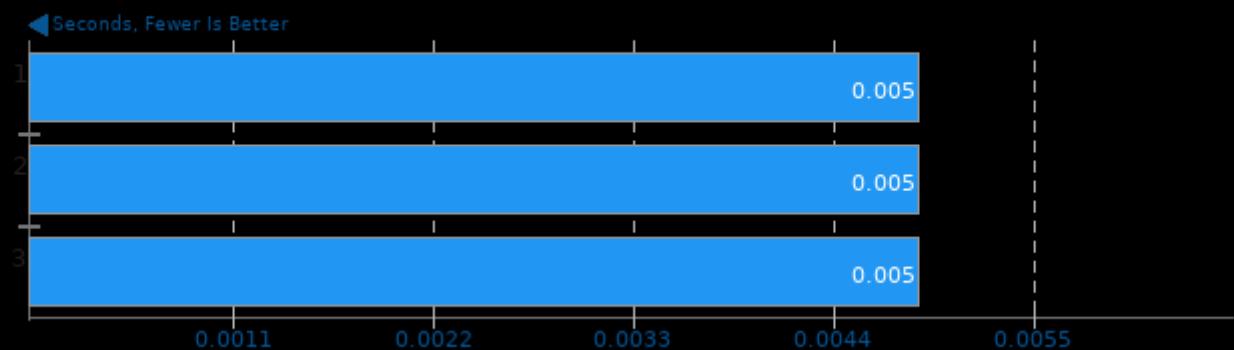
## PyHPC Benchmarks 2.1

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



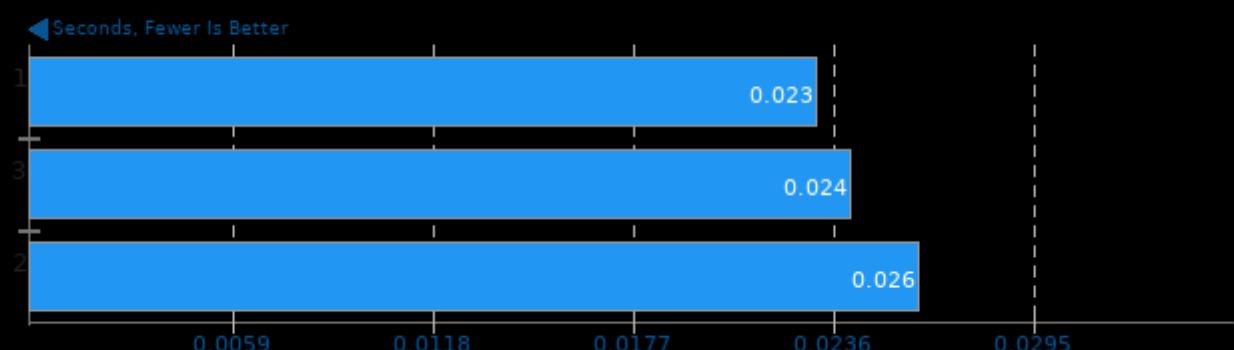
## PyHPC Benchmarks 2.1

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



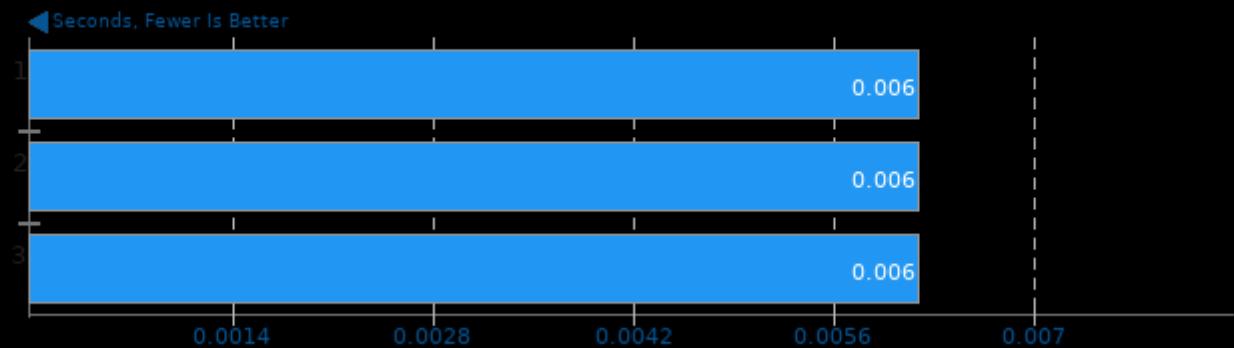
## PyHPC Benchmarks 2.1

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



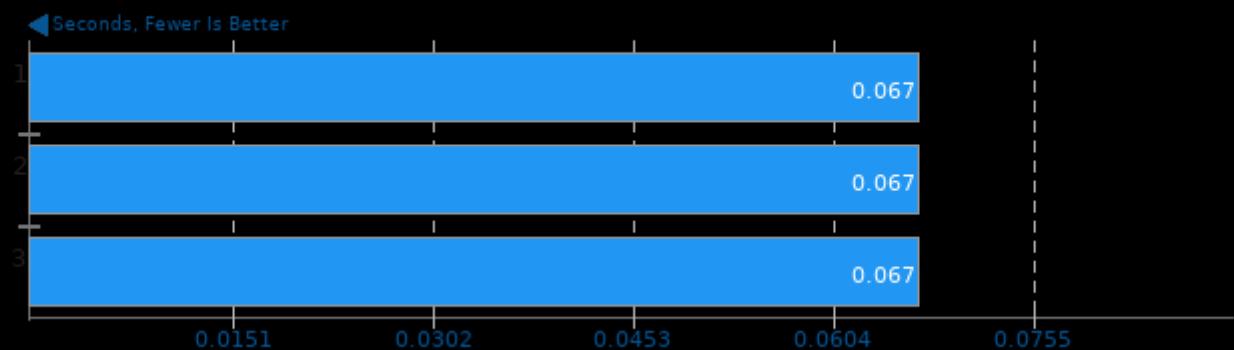
## PyHPC Benchmarks 2.1

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



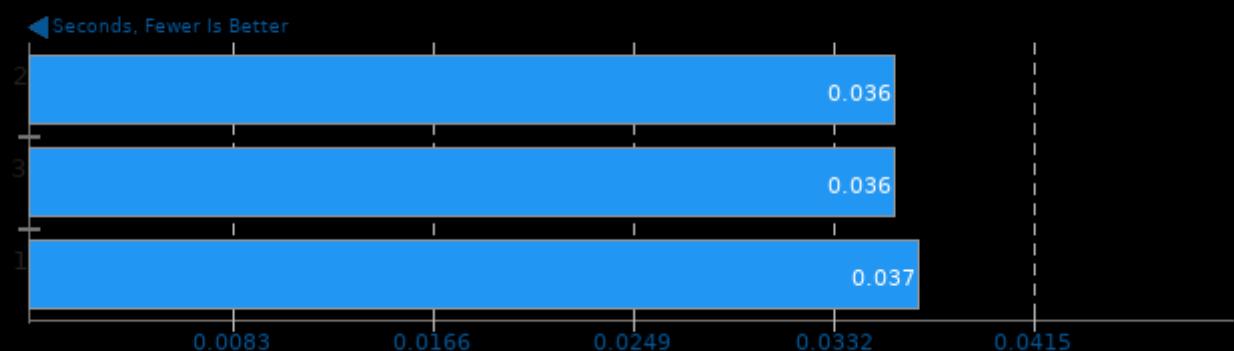
## PyHPC Benchmarks 2.1

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



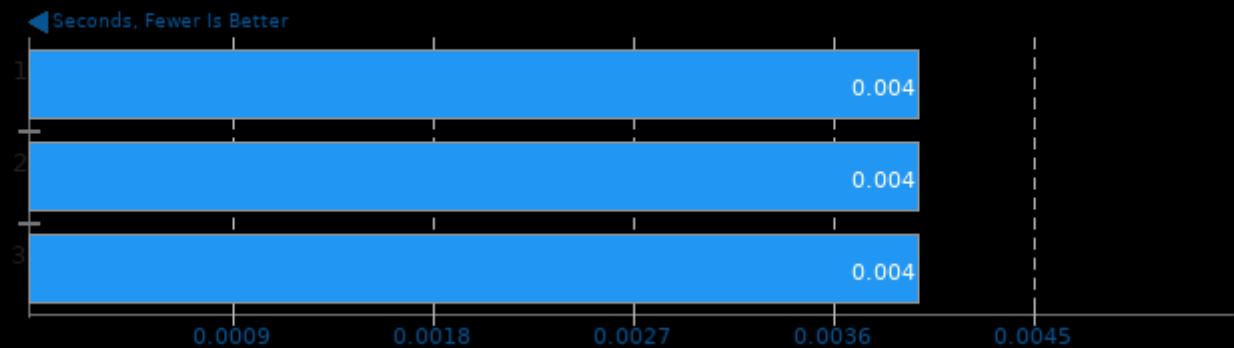
## PyHPC Benchmarks 2.1

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



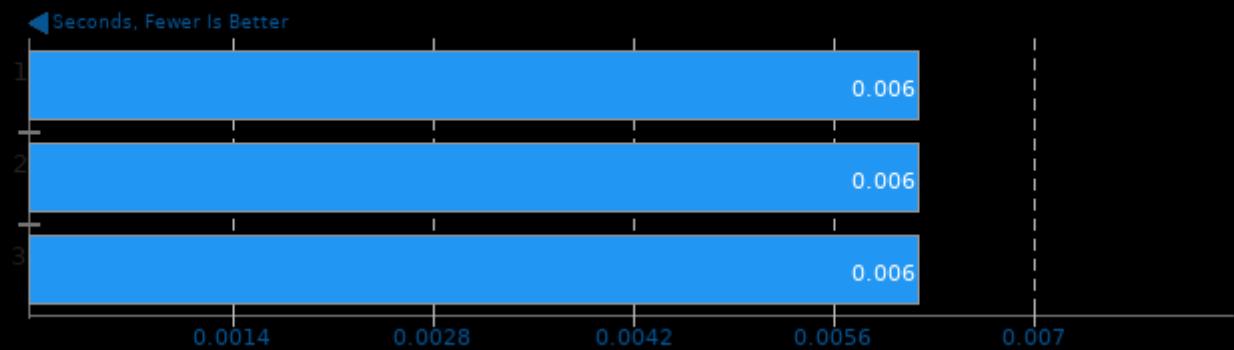
## PyHPC Benchmarks 2.1

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



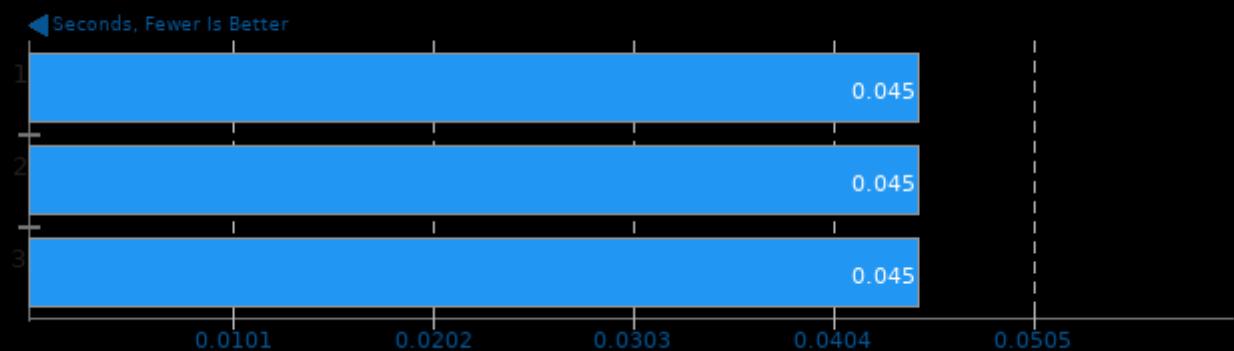
## PyHPC Benchmarks 2.1

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



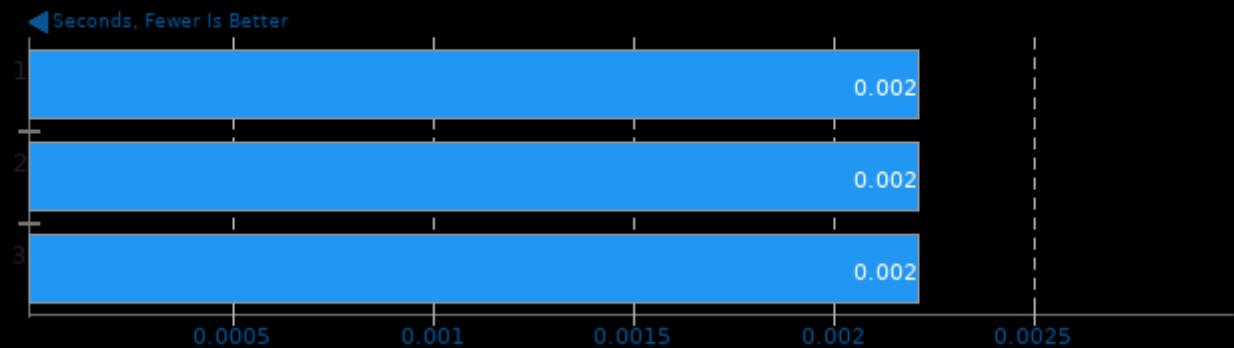
## PyHPC Benchmarks 2.1

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



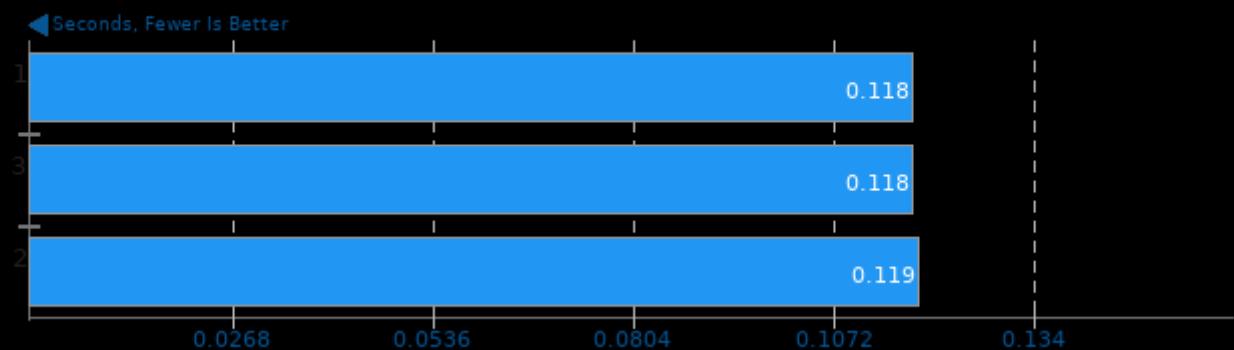
## PyHPC Benchmarks 2.1

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



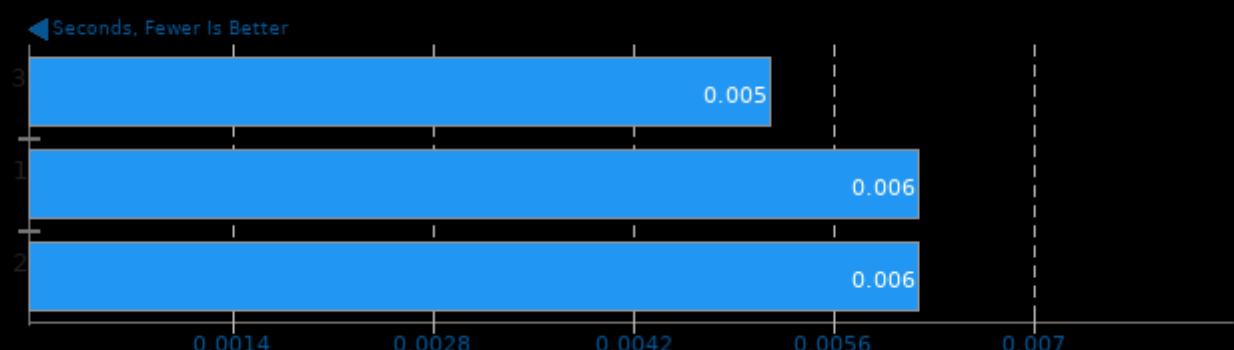
## PyHPC Benchmarks 2.1

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



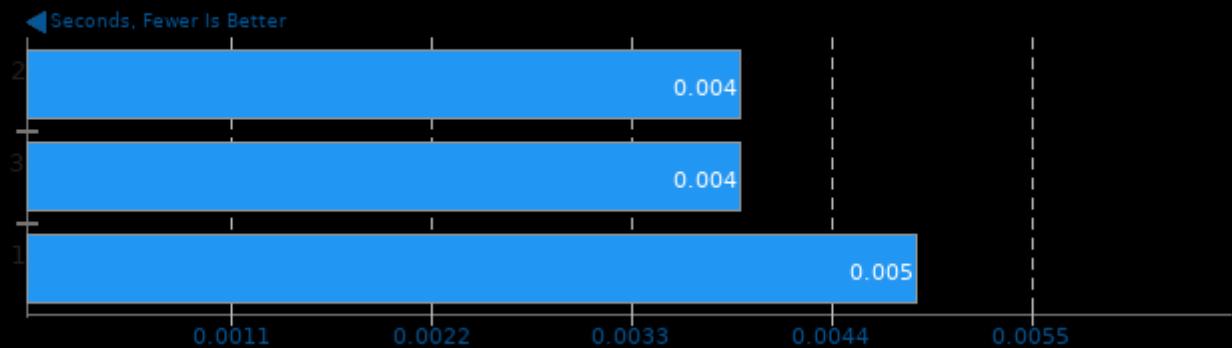
## PyHPC Benchmarks 2.1

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



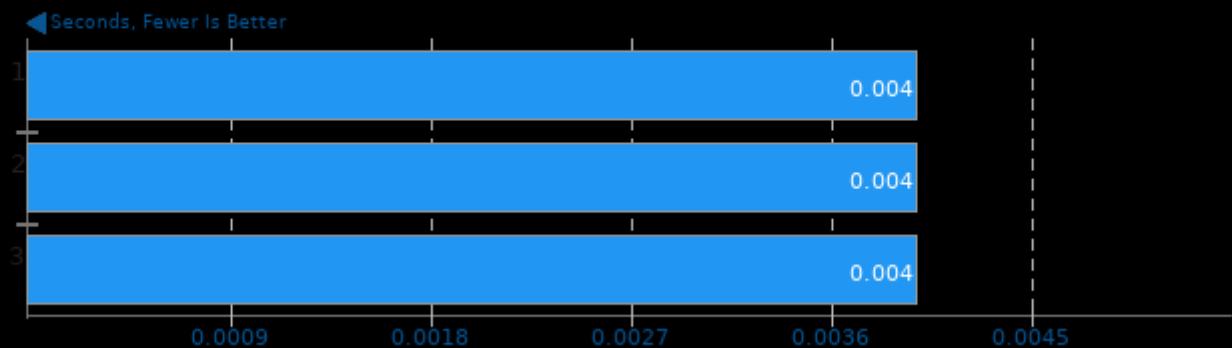
## PyHPC Benchmarks 2.1

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



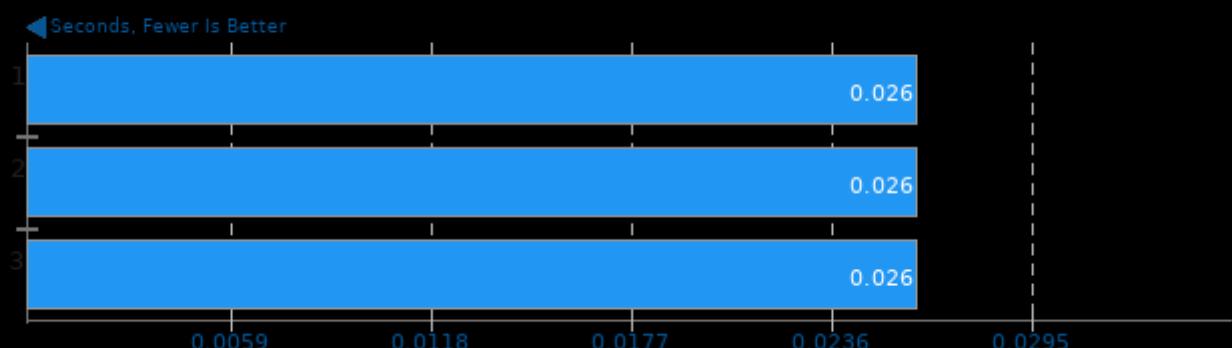
## PyHPC Benchmarks 2.1

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



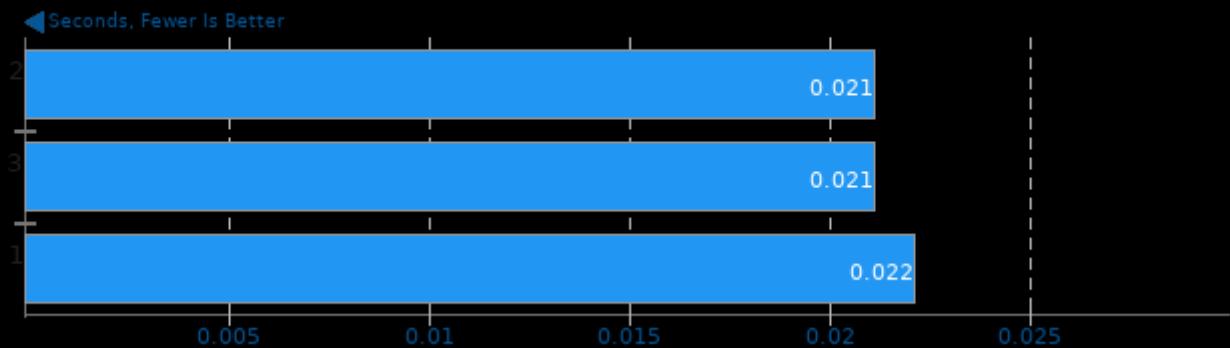
## PyHPC Benchmarks 2.1

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



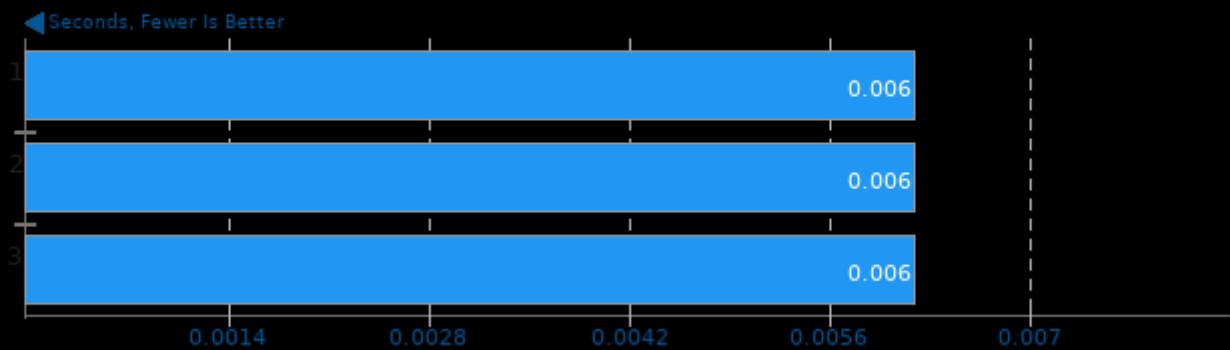
## PyHPC Benchmarks 2.1

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



## PyHPC Benchmarks 2.1

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



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