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# 990KS March

Intel Core i9-9900KS testing with a ASUS PRIME Z390-A (1502 BIOS) and ASUS Intel UHD 630 CFL GT2 3GB on Ubuntu 20.04 via the Phoronix Test Suite.

**Automated Executive Summary**

*1 had the most wins, coming in first place for 49% of the tests.*

*Based on the geometric mean of all complete results, the fastest (1) was 1.001x the speed of the slowest (2). 3 was 0.999x the speed of 1 and 2 was 1x the speed of 3.*

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

*Zstd Compression (Compression Level: 8, Long Mode - Compression Speed) at 1.044x*
*AOM AV1 (Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K) at 1.042x*
*AOM AV1 (Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 1080p) at 1.03x*
*AOM AV1 (Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 1080p) at 1.027x*
*SHOC Scalable HeterOgeneous Computing (Target: OpenCL - Benchmark: Triad) at 1.024x*
*OpenSCAD (Render: Projector Mount Swivel) at 1.022x*
*dav1d (Video Input: Chimera 1080p 10-bit) at 1.022x*
*AOM AV1 (Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K) at 1.021x*
*AOM AV1 (Encoder Mode: Speed 8 Realtime - Input: Bosphorus 1080p) at 1.02x*

*Zstd Compression (Compression Level: 3, Long Mode - Compression Speed) at 1.017x.*

# Test Systems:

## 1

## 2

## 3

Processor: Intel Core i9-9900KS @ 5.00GHz (8 Cores / 16 Threads), Motherboard: ASUS PRIME Z390-A (1502 BIOS), Chipset: Intel Cannon Lake PCH, Memory: 32GB, Disk: 240GB Corsair Force MP510, Graphics: ASUS Intel UHD 630 CFL GT2 3GB (1200MHz), Audio: Realtek ALC1220, Monitor: G237HL, Network: Intel I219-V

OS: Ubuntu 20.04, Kernel: 5.9.0-050900rc8daily20201005-generic (x86_64) 20201004, Desktop: GNOME Shell 3.36.2, Display Server: X Server 1.20.8, OpenGL: 4.6 Mesa 20.2.6, OpenCL: OpenCL 2.1, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xcc - Thermald 1.9.1
Python Notes: Python 2.7.18rc1 + Python 3.8.2
Security Notes: itlb_multihit: KVM: Mitigation of VMX unsupported + 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/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Mitigation of TSX disabled + tsx_async_abort: Mitigation of TSX disabled

| | 1 | 2 | 3 |
|---|---|---|---|
| **srsLTE - PHY_DL_Test (eNb Mb/s)** | 293.2 | **291.8** | **295.0** |
| **Normalized** | 99.39% | 98.92% | 100% |
| **Standard Deviation** | 0.1% | 0.4% | 0.5% |
| **Sysbench - CPU (Events/sec)** | 19380 | **19383** | **19367** |
| **Normalized** | 99.99% | 100% | 99.92% |
| **Standard Deviation** | 0.1% | 0.2% | 0.1% |
| **dav1d - Chimera 1080p (FPS)** | **733.64** | **731.76** | 732.83 |
| **Normalized** | 100% | 99.74% | 99.89% |
| **Standard Deviation** | 0.2% | 0.5% | 0.2% |
| **dav1d - Summer Nature 4K (FPS)** | **185.13** | 184.25 | **184.16** |
| **Normalized** | 100% | 99.52% | 99.48% |
| **Standard Deviation** | 0.1% | 0.1% | 0.2% |
| **dav1d - S.N.1 (FPS)** | 648.26 | **649.67** | **647.63** |
| **Normalized** | 99.78% | 100% | 99.69% |
| **Standard Deviation** | 0.4% | 0.2% | 0.1% |

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| **dav1d - C.1.1.b (FPS)** | **160.91** | **164.40** | 163.76 |
| **Normalized** | 97.88% | 100% | 99.61% |
| **Standard Deviation** | 0.1% | 1.8% | 1.5% |
| **AOM AV1 - Speed 0 Two-Pass - Bosphorus 4K (FPS)** | 0.12 | 0.12 | 0.12 |
| **Standard Deviation** | 0% | 0% | 0% |
| **AOM AV1 - Speed 4 Two-Pass - Bosphorus 4K (FPS)** | **3.42** | 3.41 | **3.39** |
| **Normalized** | 100% | 99.71% | 99.12% |
| **Standard Deviation** | 0.9% | 1.2% | 0.5% |
| **AOM AV1 - Speed 6 Realtime - Bosphorus 4K (FPS)** | **13.16** | **13.12** | 13.14 |
| **Normalized** | 100% | 99.7% | 99.85% |
| **Standard Deviation** | 0.3% | 0.2% | 0.1% |
| **AOM AV1 - Speed 6 Two-Pass - Bosphorus 4K (FPS)** | **6.34** | 6.32 | **6.30** |
| **Normalized** | 100% | 99.68% | 99.37% |
| **Standard Deviation** | 0.2% | 0.5% | 0.4% |
| **AOM AV1 - Speed 8 Realtime - Bosphorus 4K (FPS)** | **38.68** | 37.94 | **37.12** |
| **Normalized** | 100% | 98.09% | 95.97% |
| **Standard Deviation** | 0.2% | 0.3% | 2.8% |
| **AOM AV1 - Speed 9 Realtime - Bosphorus 4K (FPS)** | **47.78** | 48.72 | **48.78** |
| **Normalized** | 97.95% | 99.88% | 100% |
| **Standard Deviation** | 4.3% | 0.4% | 0.2% |
| **AOM AV1 - Speed 0 Two-Pass - Bosphorus 1080p (FPS)** | **0.38** | **0.37** | **0.38** |
| **Normalized** | 100% | 97.37% | 100% |
| **Standard Deviation** | 1.5% | 1.5% | 0% |
| **AOM AV1 - Speed 4 Two-Pass - Bosphorus 1080p (FPS)** | **6.76** | **6.73** | 6.75 |
| **Normalized** | 100% | 99.56% | 99.85% |
| **Standard Deviation** | 0.2% | 0.6% | 0.4% |
| **AOM AV1 - Speed 6 Realtime - Bosphorus 1080p (FPS)** | 25.06 | **24.95** | **25.07** |
| **Normalized** | 99.96% | 99.52% | 100% |
| **Standard Deviation** | 1.6% | 2.6% | 1.5% |
| **AOM AV1 - Speed 6 Two-Pass - Bosphorus 1080p (FPS)** | **19.68** | **19.11** | 19.21 |
| **Normalized** | 100% | 97.1% | 97.61% |
| **Standard Deviation** | 1.5% | 0.7% | 0.1% |
| **AOM AV1 - Speed 8 Realtime - Bosphorus 1080p (FPS)** | **124.39** | 122.64 | **121.96** |
| **Normalized** | 100% | 98.59% | 98.05% |
| **Standard Deviation** | 0.6% | 2.7% | 3.7% |
| **AOM AV1 - Speed 9 Realtime - Bosphorus 1080p (FPS)** | **141.48** | 140.39 | **139.82** |
| **Normalized** | 100% | 99.23% | 98.83% |
| **Standard Deviation** | 2.8% | 0.6% | 2.9% |
| **SVT-HEVC - 1 - Bosphorus 1080p (FPS)** | **6.85** | **6.84** | **6.84** |
| **Normalized** | 100% | 99.85% | 99.85% |
| **Standard Deviation** | 0.3% | 0.1% | 0.1% |

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| **SVT-HEVC - 7 - Bosphorus 1080p (FPS)** | **106.19** | 105.90 | **105.78** |
| **Normalized** | 100% | 99.73% | 99.61% |
| **Standard Deviation** | 0.2% | 0.1% | 0.2% |
| **SVT-HEVC - 10 - Bosphorus 1080p (FPS)** | **230.27** | 229.42 | **229.36** |
| **Normalized** | 100% | 99.63% | 99.6% |
| **Standard Deviation** | 0.1% | 0.1% | 0.3% |
| **SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)** | **173.31** | 172.24 | **172.10** |
| **Normalized** | 100% | 99.38% | 99.3% |
| **Standard Deviation** | 0.2% | 0.4% | 0.3% |
| **SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)** | **176.29** | 175.27 | **175.06** |
| **Normalized** | 100% | 99.42% | 99.3% |
| **Standard Deviation** | 0.3% | 0.5% | 0.1% |
| **SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)** | **136.76** | 136.22 | **136.05** |
| **Normalized** | 100% | 99.61% | 99.48% |
| **Standard Deviation** | 0.3% | 0.2% | 0.4% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Triad (GB/s)** | **15.6053** | **15.2336** | 15.2518 |
| **Normalized** | 100% | 97.62% | 97.73% |
| **Standard Deviation** | 0.3% | 0.1% | 0.4% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Reduction (GB/s)** | **36.7934** | **36.7270** | 36.7633 |
| **Normalized** | 100% | 99.82% | 99.92% |
| **Standard Deviation** | 0.2% | 0.3% | 0.1% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Bus Speed Download (GB/s)** | **29.2119** | **29.1641** | 29.1766 |
| **Normalized** | 100% | 99.84% | 99.88% |
| **Standard Deviation** | 0.6% | 0.3% | 0.9% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Bus Speed Readback (GB/s)** | **29.0495** | 29.0520 | **29.1531** |
| **Normalized** | 99.64% | 99.65% | 100% |
| **Standard Deviation** | 1.3% | 0.6% | 1.2% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - T.R.B (GB/s)** | 56.9099 | **56.8932** | **56.9175** |
| **Normalized** | 99.99% | 99.96% | 100% |
| **Standard Deviation** | 0% | 0% | 0% |
| **simdjson - Kostya (GB/s)** | **3.1** | **3.10** | **3.09** |
| **Normalized** | 100% | 100% | 99.68% |
| **Standard Deviation** | 0% | 0.2% | 0.6% |
| **simdjson - LargeRand (GB/s)** | 1.07 | 1.07 | 1.07 |
| **Standard Deviation** | 0% | 0% | 0% |
| **simdjson - PartialTweets (GB/s)** | **4.38** | **4.38** | **4.37** |
| **Normalized** | 100% | 100% | 99.77% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **simdjson - DistinctUserID (GB/s)** | **4.53** | **4.55** | 4.54 |
| **Normalized** | 99.56% | 100% | 99.78% |
| **Standard Deviation** | 0.1% | 0.3% | 0.3% |
| **ViennaCL - CPU BLAS - sCOPY (GB/s)** | **28.2** | **28.2** | **28.3** |
| **Normalized** | 99.65% | 99.65% | 100% |
| **Standard Deviation** | 0.2% | 0.2% | 0.2% |
| **ViennaCL - CPU BLAS - sAXPY (GB/s)** | **42.8** | **42.9** | **42.8** |
| **Normalized** | 99.77% | 100% | 99.77% |
| **Standard Deviation** | 0.1% | 0.3% | 0.4% |
| **ViennaCL - CPU BLAS - sDOT (GB/s)** | 47.9 | 47.9 | 47.9 |

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|---|---|---|---|
| **Standard Deviation** | 0.2% | 0.1% | 0.1% |
| **ViennaCL - CPU BLAS - dCOPY (GB/s)** | 26.2 | 26.2 | 26.2 |
| **Standard Deviation** | 0.2% | 0% | 0% |
| **ViennaCL - CPU BLAS - dAXPY (GB/s)** | 39.3 | 39.3 | 39.3 |
| **Standard Deviation** | 0% | 0% | 0% |
| **ViennaCL - CPU BLAS - dDOT (GB/s)** | 44.1 | 44.1 | 44.1 |
| **Standard Deviation** | 0.1% | 0% | 0% |
| **ViennaCL - CPU BLAS - dGEMV-N (GB/s)** | **45.5** | **45.6** | **45.5** |
| **Normalized** | 99.78% | 100% | 99.78% |
| **Standard Deviation** | 0% | 0.1% | 0.1% |
| **ViennaCL - CPU BLAS - dGEMV-T (GB/s)** | 46.5 | 46.5 | 46.5 |
| **Standard Deviation** | 0.1% | 0% | 0% |
| **ViennaCL - OpenCL BLAS - sCOPY (GB/s)** | **32.9** | **33.3** | **33.3** |
| **Normalized** | 98.8% | 100% | 100% |
| **Standard Deviation** | 0.3% | 0.5% | 0.3% |
| **ViennaCL - OpenCL BLAS - sAXPY (GB/s)** | 34.6 | 34.6 | 34.6 |
| **Standard Deviation** | 0% | 0% | 0% |
| **ViennaCL - OpenCL BLAS - sDOT (GB/s)** | **37.7** | **37.6** | **37.6** |
| **Normalized** | 100% | 99.73% | 99.73% |
| **Standard Deviation** | 0% | 0.2% | 0.2% |
| **ViennaCL - OpenCL BLAS - dCOPY (GB/s)** | **34.0** | 34.1 | **34.2** |
| **Normalized** | 99.42% | 99.71% | 100% |
| **Standard Deviation** | 0.2% | 0.2% | 0.2% |
| **ViennaCL - OpenCL BLAS - dAXPY (GB/s)** | **35.3** | **35.3** | **35.4** |
| **Normalized** | 99.72% | 99.72% | 100% |
| **Standard Deviation** | 0.2% | 0% | 0.2% |
| **ViennaCL - OpenCL BLAS - dDOT (GB/s)** | 38 | 38 | 38 |
| **ViennaCL - OpenCL BLAS - dGEMV-N (GB/s)** | **37.9** | **38.1** | **37.9** |
| **Normalized** | 99.48% | 100% | 99.48% |
| **Standard Deviation** | 0% | | |
| **ViennaCL - OpenCL BLAS - dGEMV-T (GB/s)** | **34.8** | **34.7** | **34.8** |
| **Normalized** | 100% | 99.71% | 100% |
| **Standard Deviation** | 0% | 0.2% | 0.2% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - S3D (GFLOPS)** | **20.9931** | 20.8518 | **20.8479** |
| **Normalized** | 100% | 99.33% | 99.31% |
| **Standard Deviation** | 0.3% | 0.3% | 0.2% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - FFT SP (GFLOPS)** | 15.3682 | **15.3757** | **15.3573** |
| **Normalized** | 99.95% | 100% | 99.88% |
| **Standard Deviation** | 0.1% | 0.1% | 0.2% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - GEMM SGEMM_N (GFLOPS)** | **245.920** | 245.885 | **245.783** |
| **Normalized** | 100% | 99.99% | 99.94% |
| **Standard Deviation** | 0% | 0% | 0% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - Max SP Flops (GFLOPS)** | 1761 | **1761** | **1761** |
| **Normalized** | 99.98% | 100% | 99.97% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **ViennaCL - CPU BLAS - dGEMM-NN (GFLOPs/s)** | 34.8 | 34.8 | 34.8 |
| **Standard Deviation** | 0% | 0% | 0.2% |

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| **ViennaCL - CPU BLAS - dGEMM-NT (GFLOPs/s)** | **34.1** | **34.2** | **34.1** |
| **Normalized** | 99.71% | 100% | 99.71% |
| **Standard Deviation** | 0.2% | 0.3% | 0.2% |
| **ViennaCL - CPU BLAS - dGEMM-TN (GFLOPs/s)** | **36.5** | **36.4** | **36.5** |
| **Normalized** | 100% | 99.73% | 100% |
| **Standard Deviation** | 0.2% | 0.3% | 0% |
| **ViennaCL - CPU BLAS - dGEMM-TT (GFLOPs/s)** | 35.5 | 35.5 | 35.5 |
| **Standard Deviation** | 0.2% | 0.2% | 0.2% |
| **ViennaCL - OpenCL BLAS - dGEMM-NN (GFLOPs/s)** | 18.9 | 18.9 | 18.9 |
| **Standard Deviation** | 0% | 0% | 0% |
| **ViennaCL - OpenCL BLAS - dGEMM-NT (GFLOPs/s)** | **16.5** | **16.5** | **16.4** |
| **Normalized** | 100% | 100% | 99.39% |
| **Standard Deviation** | 0% | 0.4% | 0.4% |
| **ViennaCL - OpenCL BLAS - dGEMM-TN (GFLOPs/s)** | 15.8 | 15.8 | 15.8 |
| **Standard Deviation** | 0.4% | 0.4% | 0.4% |
| **ViennaCL - OpenCL BLAS - dGEMM-TT (GFLOPs/s)** | 15.7 | 15.7 | 15.7 |
| **Standard Deviation** | 0% | 0% | 0% |
| **SHOC Scalable HeterOgeneous Computing - OpenCL - MD5 Hash (GHash/s)** | **0.3861** | **0.3861** | **0.386** |
| **Normalized** | 100% | 100% | 99.97% |
| **Standard Deviation** | 0% | 0% | 0% |
| **GNU GMP GMPbench - Total Time (GMPbench Score)** | **6250** | 6222 | **6218** |
| **Normalized** | 100% | 99.54% | 99.48% |
| **Zstd Compression - 3 - Compression Speed (MB/s)** | 2379 | **2375** | **2388** |
| **Normalized** | 99.62% | 99.42% | 100% |
| **Standard Deviation** | 0.9% | 1.2% | 0.9% |
| **Zstd Compression - 3 - D.S (MB/s)** | **4187** | **4165** | 4180 |
| **Normalized** | 100% | 99.47% | 99.85% |
| **Standard Deviation** | 0.2% | 0.8% | 0.1% |
| **Zstd Compression - 8 - Compression Speed (MB/s)** | **332.6** | 327.6 | **327.5** |
| **Normalized** | 100% | 98.5% | 98.47% |
| **Standard Deviation** | 0.9% | 1.2% | 0.5% |
| **Zstd Compression - 8 - D.S (MB/s)** | **4312** | 4309 | **4308** |
| **Normalized** | 100% | 99.92% | 99.89% |
| **Standard Deviation** | 0.5% | 0.2% | 0.2% |
| **Zstd Compression - 19 - Compression Speed (MB/s)** | **34.5** | **34.6** | **34.6** |
| **Normalized** | 99.71% | 100% | 100% |
| **Standard Deviation** | 0.6% | 0.3% | 0.3% |
| **Zstd Compression - 19 - D.S (MB/s)** | **3969** | **3983** | 3982 |
| **Normalized** | 99.65% | 100% | 99.97% |
| **Standard Deviation** | 0.5% | 0.1% | 0.2% |

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| **Zstd Compression - 3, Long Mode - Compression Speed (MB/s)** | 1164 | **1157** | **1177** |
| **Normalized** | 98.89% | 98.28% | 100% |
| **Standard Deviation** | 0.8% | 1.6% | 1% |
| **Zstd Compression - 3, Long Mode - D.S** | **4433** | 4438 | **4443** |
| **Normalized** | 99.79% | 99.89% | 100% |
| **Standard Deviation** | 0.3% | 0.2% | 0.1% |
| **Zstd Compression - 8, Long Mode - Compression Speed (MB/s)** | **395.1** | **378.4** | 387.2 |
| **Normalized** | 100% | 95.77% | 98% |
| **Standard Deviation** | 2.1% | 0.9% | 1.3% |
| **Zstd Compression - 8, Long Mode - D.S** | **4610** | 4601 | **4575** |
| **Normalized** | 100% | 99.82% | 99.24% |
| **Standard Deviation** | 0.1% | 0.1% | 0.8% |
| **Zstd Compression - 19, Long Mode - Compression Speed (MB/s)** | **31.9** | 31.8 | **31.5** |
| **Normalized** | 100% | 99.69% | 98.75% |
| **Standard Deviation** | 0.7% | 0.3% | 0.4% |
| **Zstd Compression - 19, Long Mode - D.S (MB/s)** | 3958 | **3964** | **3939** |
| **Normalized** | 99.84% | 100% | 99.38% |
| **Standard Deviation** | 0.4% | 0% | 0.3% |
| **Botan - KASUMI (MiB/s)** | 112.980 | **112.943** | **112.985** |
| **Normalized** | 100% | 99.96% | 100% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **Botan - KASUMI - Decrypt (MiB/s)** | 107.861 | **107.764** | **107.878** |
| **Normalized** | 99.98% | 99.89% | 100% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **Botan - AES-256 (MiB/s)** | **4816** | **4815** | 4816 |
| **Normalized** | 100% | 99.98% | 99.99% |
| **Standard Deviation** | 0% | 0% | 0% |
| **Botan - AES-256 - Decrypt (MiB/s)** | **4806** | 4811 | **4812** |
| **Normalized** | 99.87% | 99.97% | 100% |
| **Standard Deviation** | 0.2% | 0% | 0% |
| **Botan - Twofish (MiB/s)** | 436.078 | **436.124** | **434.656** |
| **Normalized** | 99.99% | 100% | 99.66% |
| **Standard Deviation** | 0.1% | 0% | 0.7% |
| **Botan - Twofish - Decrypt (MiB/s)** | **437.297** | 437.288 | **436.744** |
| **Normalized** | 100% | 100% | 99.87% |
| **Standard Deviation** | 0.1% | 0.1% | 0.4% |
| **Botan - Blowfish (MiB/s)** | 543.597 | **543.385** | **543.951** |
| **Normalized** | 99.93% | 99.9% | 100% |
| **Standard Deviation** | 0% | 0.1% | 0% |
| **Botan - Blowfish - Decrypt (MiB/s)** | 539.238 | **539.017** | **539.337** |
| **Normalized** | 99.98% | 99.94% | 100% |
| **Standard Deviation** | 0% | 0.1% | 0% |
| **Botan - CAST-256 (MiB/s)** | 171.954 | **171.951** | **171.958** |
| **Normalized** | 100% | 100% | 100% |
| **Standard Deviation** | 0% | 0% | 0% |
| **Botan - CAST-256 - Decrypt (MiB/s)** | 172.091 | **172.076** | **172.150** |
| **Normalized** | 99.97% | 99.96% | 100% |
| **Standard Deviation** | 0% | 0% | 0% |
| **Botan - ChaCha20Poly1305 (MiB/s)** | **916.108** | **913.025** | 914.454 |
| **Normalized** | 100% | 99.66% | 99.82% |
| **Standard Deviation** | 0% | 0.6% | 0.3% |

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| **Botan - ChaCha20Poly1305 - Decrypt (MiB/s)** | 908.311 | **907.952** | **908.474** |
| **Normalized** | 99.98% | 99.94% | 100% |
| **Standard Deviation** | 0.1% | 0.2% | 0.1% |
| **LuaRadio - F.B.t.B.F.F (MiB/s)** | **1298** | 1292 | **1292** |
| **Normalized** | 100% | 99.58% | 99.53% |
| **Standard Deviation** | 0.4% | 0.4% | 0.7% |
| **LuaRadio - F.D.F (MiB/s)** | **486.8** | 487.7 | **489.5** |
| **Normalized** | 99.45% | 99.63% | 100% |
| **Standard Deviation** | 0.7% | 0.7% | 0.1% |
| **LuaRadio - Hilbert Transform (MiB/s)** | 87.2 | **87.1** | **87.5** |
| **Normalized** | 99.66% | 99.54% | 100% |
| **Standard Deviation** | 0.1% | 0.1% | 0.6% |
| **LuaRadio - Complex Phase (MiB/s)** | **704.2** | 700.2 | **698.1** |
| **Normalized** | 100% | 99.43% | 99.13% |
| **Standard Deviation** | 1.5% | 1.7% | 2.8% |
| **GNU Radio - F.B.t.B.F.F (MiB/s)** | 1190 | **1196** | **1189** |
| **Normalized** | 99.56% | 100% | 99.43% |
| **Standard Deviation** | 1.8% | 1.4% | 2.2% |
| **GNU Radio - S.S.C (MiB/s)** | **3003** | **3011** | 3011 |
| **Normalized** | 99.73% | 100% | 99.99% |
| **Standard Deviation** | 0.2% | 0.1% | 0.2% |
| **GNU Radio - FIR Filter (MiB/s)** | **822.3** | 820.0 | **818.3** |
| **Normalized** | 100% | 99.72% | 99.51% |
| **Standard Deviation** | 0.3% | 0.8% | 0.6% |
| **GNU Radio - IIR Filter (MiB/s)** | **666.1** | **664.9** | 665.0 |
| **Normalized** | 100% | 99.82% | 99.83% |
| **Standard Deviation** | 0.3% | 0.3% | 0.2% |
| **GNU Radio - F.D.F (MiB/s)** | **836.7** | **837.7** | 837.3 |
| **Normalized** | 99.88% | 100% | 99.95% |
| **Standard Deviation** | 0.5% | 0.4% | 0.3% |
| **GNU Radio - Hilbert Transform (MiB/s)** | **618.0** | 618.3 | **620.2** |
| **Normalized** | 99.65% | 99.69% | 100% |
| **Standard Deviation** | 0.3% | 0.7% | 0.3% |
| **Sysbench - RAM / Memory (MiB/sec)** | 28391 | **28492** | **28339** |
| **Normalized** | 99.65% | 100% | 99.46% |
| **Standard Deviation** | 0.6% | 0.8% | 0.3% |
| **Stockfish - Total Time (Nodes/s)** | 23777878 | **23501591** | **23832208** |
| **Normalized** | 99.77% | 98.61% | 100% |
| **Standard Deviation** | 2.5% | 2.2% | 2.7% |
| **srsLTE - OFDM_Test (Samples / Second)** | **126700000** | 128466667 | **128500000** |
| **Normalized** | 98.6% | 99.97% | 100% |
| **Standard Deviation** | 0.6% | 1.1% | 0.9% |
| **Liquid-DSP - 1 - 256 - 57 (samples/s)** | 67629667 | **67632333** | **67599667** |
| **Normalized** | 100% | 100% | 99.95% |
| **Standard Deviation** | 0% | 0% | 0.1% |
| **Liquid-DSP - 2 - 256 - 57 (samples/s)** | 130183333 | **130046667** | **130663333** |
| **Normalized** | 99.63% | 99.53% | 100% |
| **Standard Deviation** | 0.1% | 0.5% | 0% |
| **Liquid-DSP - 4 - 256 - 57 (samples/s)** | **250856667** | **251576667** | 251473333 |
| **Normalized** | 99.71% | 100% | 99.96% |
| **Standard Deviation** | 0.2% | 0.3% | 0.2% |
| **Liquid-DSP - 8 - 256 - 57 (samples/s)** | 452713333 | **452073333** | **453086667** |
| **Normalized** | 99.92% | 99.78% | 100% |
| **Standard Deviation** | 0.6% | 0.2% | 0.8% |
| **Liquid-DSP - 16 - 256 - 57 (samples/s)** | **500333333** | 500263333 | **500016667** |

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| | | | |
|---|---|---|---|
| **Normalized** | 100% | 99.99% | 99.94% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **srsLTE - PHY_DL_Test (UE Mb/s)** | 112.7 | **112.2** | **113.4** |
| **Normalized** | 99.38% | 98.94% | 100% |
| **Standard Deviation** | 0.1% | 0.2% | 0.2% |
| **toyBrot Fractal Generator - TBB (ms)** | **44058** | **44135** | 44085 |
| **Normalized** | 100% | 99.83% | 99.94% |
| **Standard Deviation** | 0.2% | 0.3% | 0.3% |
| **toyBrot Fractal Generator - OpenMP (ms)** | **43866** | 43854 | **43838** |
| **Normalized** | 99.94% | 99.96% | 100% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **toyBrot Fractal Generator - C++ Tasks (ms)** | 44756 | **44842** | **44729** |
| **Normalized** | 99.94% | 99.75% | 100% |
| **Standard Deviation** | 0.1% | 0.5% | 0.1% |
| **toyBrot Fractal Generator - C++ Threads** | **44854** | **44774** | 44805 |
| **Normalized** | 99.82% | 100% | 99.93% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **oneDNN - IP Shapes 1D - f32 - CPU (ms)** | **3.57740** | 3.57455 | **3.56577** |
| **Normalized** | 99.67% | 99.75% | 100% |
| **Standard Deviation** | 0.6% | 0.4% | 0.1% |
| **oneDNN - IP Shapes 3D - f32 - CPU (ms)** | **8.26103** | **8.14695** | 8.16788 |
| **Normalized** | 98.62% | 100% | 99.74% |
| **Standard Deviation** | 0.1% | 0.1% | 0.3% |
| **oneDNN - IP Shapes 1D - u8s8f32 - CPU (ms)** | **1.66747** | 1.66579 | **1.6655** |
| **Normalized** | 99.88% | 99.98% | 100% |
| **Standard Deviation** | 0.2% | 0.3% | 0.1% |
| **oneDNN - IP Shapes 3D - u8s8f32 - CPU (ms)** | **1.83215** | 1.82910 | **1.82340** |
| **Normalized** | 99.52% | 99.69% | 100% |
| **Standard Deviation** | 0.3% | 0.5% | 0.2% |
| **oneDNN - C.B.S.A - f32 - CPU (ms)** | **14.2830** | **14.3031** | 14.2936 |
| **Normalized** | 100% | 99.86% | 99.93% |
| **Standard Deviation** | 0.2% | 0.4% | 0.2% |
| **oneDNN - D.B.s - f32 - CPU (ms)** | **8.83898** | 8.86501 | **8.87618** |
| **Normalized** | 100% | 99.71% | 99.58% |
| **Standard Deviation** | 0.1% | 0.3% | 0.1% |
| **oneDNN - D.B.s - f32 - CPU (ms)** | 6.63993 | **6.64659** | **6.61557** |
| **Normalized** | 99.63% | 99.53% | 100% |
| **Standard Deviation** | 0.3% | 0.4% | 0.1% |
| **oneDNN - C.B.S.A - u8s8f32 - CPU (ms)** | **14.0335** | **13.9988** | 14.0106 |
| **Normalized** | 99.75% | 100% | 99.92% |
| **Standard Deviation** | 0.3% | 0.2% | 0.3% |
| **oneDNN - D.B.s - u8s8f32 - CPU (ms)** | **2.14490** | **2.14385** | 2.14452 |
| **Normalized** | 99.95% | 100% | 99.97% |
| **Standard Deviation** | 0.3% | 0.2% | 0.1% |
| **oneDNN - D.B.s - u8s8f32 - CPU (ms)** | **3.97706** | **3.93198** | 3.93216 |
| **Normalized** | 98.87% | 100% | 100% |
| **Standard Deviation** | 0.9% | 0.5% | 0.8% |
| **oneDNN - R.N.N.T - f32 - CPU (ms)** | **3408** | **3405** | 3406 |
| **Normalized** | 99.92% | 100% | 99.98% |
| **Standard Deviation** | 0.3% | 0.2% | 0.2% |
| **oneDNN - R.N.N.I - f32 - CPU (ms)** | **1852** | **1851** | 1852 |
| **Normalized** | 99.95% | 100% | 99.95% |
| **Standard Deviation** | 0.1% | 0.2% | 0% |
| **oneDNN - R.N.N.T - u8s8f32 - CPU (ms)** | **3415** | **3413** | 3414 |
| **Normalized** | 99.96% | 100% | 99.97% |

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| | | | |
|---|---|---|---|
| Standard Deviation | 0.2% | 0% | 0% |
| **oneDNN - R.N.N.I - u8s8f32 - CPU (ms)** | **1852** | **1851** | 1851 |
| Normalized | 99.92% | 100% | 99.97% |
| Standard Deviation | 0.1% | 0% | 0.1% |
| **oneDNN - M.M.B.S.T - f32 - CPU (ms)** | **3.15433** | 3.15157 | **3.14943** |
| Normalized | 99.84% | 99.93% | 100% |
| Standard Deviation | 0.4% | 0.2% | 0.5% |
| **oneDNN - R.N.N.T - bf16bf16bf16 - CPU (ms)** | **3414** | **3445** | 3415 |
| Normalized | 100% | 99.09% | 99.96% |
| Standard Deviation | 0.1% | 1.3% | 0% |
| **oneDNN - R.N.N.I - bf16bf16bf16 - CPU (ms)** | **1855** | **1851** | 1854 |
| Normalized | 99.8% | 100% | 99.83% |
| Standard Deviation | 0.3% | 0.1% | 0.1% |
| **oneDNN - M.M.B.S.T - u8s8f32 - CPU (ms)** | **3.44003** | **3.43359** | 3.43914 |
| Normalized | 99.81% | 100% | 99.84% |
| Standard Deviation | 0.2% | 0.1% | 0.1% |
| **Mobile Neural Network - SqueezeNetV1.0** | 4.899 | **4.882** | **4.943** |
| Normalized | 99.65% | 100% | 98.77% |
| Standard Deviation | 1% | 1.1% | 1% |
| **Mobile Neural Network - resnet-v2-50 (ms)** | 25.308 | **25.254** | **25.414** |
| Normalized | 99.79% | 100% | 99.37% |
| Standard Deviation | 0.3% | 0.2% | 0.3% |
| **Mobile Neural Network - MobileNetV2_224** | 2.672 | **2.655** | **2.683** |
| Normalized | 99.36% | 100% | 98.96% |
| Standard Deviation | 4.1% | 3.3% | 4.1% |
| **Mobile Neural Network - mobilenet-v1-1.0** | **2.329** | 2.333 | **2.346** |
| Normalized | 100% | 99.83% | 99.28% |
| Standard Deviation | 0.5% | 0.5% | 0.7% |
| **Mobile Neural Network - inception-v3 (ms)** | **29.447** | 29.670 | **29.795** |
| Normalized | 100% | 99.25% | 98.83% |
| Standard Deviation | 0.4% | 0.2% | 1% |
| **Systemd Total Boot Time - Total (ms)** | 24050 | 24050 | 24050 |
| **Systemd Total Boot Time - Kernel (ms)** | 1941 | 1941 | 1941 |
| **Systemd Total Boot Time - Loader (ms)** | 3555 | 3555 | 3555 |
| **Systemd Total Boot Time - Firmware (ms)** | 15679 | 15679 | 15679 |
| **Systemd Total Boot Time - Userspace (ms)** | 22109 | 22109 | 22109 |
| **Xcompact3d Incompact3d - i.i.1.C.P.D (sec)** | **34.3375969** | **34.4397227** | 34.3846003 |
| Normalized | 100% | 99.7% | 99.86% |
| Standard Deviation | 1.8% | 1.7% | 1.6% |
| **Xcompact3d Incompact3d - i.i.1.C.P.D (sec)** | **121.691170** | **121.826073** | 121.742472 |
| Normalized | 100% | 99.89% | 99.96% |
| Standard Deviation | 0% | 0% | 0.1% |
| **libavif avifenc - 0 (sec)** | 72.074 | **72.258** | **71.799** |
| Normalized | 99.62% | 99.36% | 100% |
| Standard Deviation | 0.4% | 0.6% | 0.6% |
| **libavif avifenc - 2 (sec)** | **37.253** | 37.304 | **37.326** |
| Normalized | 100% | 99.86% | 99.8% |
| Standard Deviation | 0.3% | 0.5% | 0.4% |
| **libavif avifenc - 6 (sec)** | **12.952** | **13.005** | 12.964 |
| Normalized | 100% | 99.59% | 99.91% |
| Standard Deviation | 0.5% | 0.6% | 0.2% |
| **libavif avifenc - 10 (sec)** | **3.154** | 3.160 | **3.170** |
| Normalized | 100% | 99.81% | 99.5% |
| Standard Deviation | 0.2% | 0.5% | 0.6% |

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|---|---|---|---|
| **libavif avifenc - 6, Lossless (sec)** | **62.674** | **62.389** | 62.396 |
| **Normalized** | 99.55% | 100% | 99.99% |
| **Standard Deviation** | 0.4% | 0.3% | 0.4% |
| **libavif avifenc - 10, Lossless (sec)** | 5.778 | **5.771** | **5.787** |
| **Normalized** | 99.88% | 100% | 99.72% |
| **Standard Deviation** | 0.4% | 0.4% | 0.4% |
| **Timed Linux Kernel Compilation - Time To Compile (sec)** | 94.714 | **94.569** | **94.768** |
| **Normalized** | 99.85% | 100% | 99.79% |
| **Standard Deviation** | 1.4% | 1.1% | 0.9% |
| **Timed Mesa Compilation - Time To Compile (sec)** | **56.415** | 56.468 | **56.475** |
| **Normalized** | 100% | 99.91% | 99.89% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **Timed Node.js Compilation - Time To Compile (sec)** | 477.097 | **476.801** | **477.284** |
| **Normalized** | 99.94% | 100% | 99.9% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **Timed Erlang/OTP Compilation - Time To Compile (sec)** | **113.000** | 112.558 | **112.484** |
| **Normalized** | 99.54% | 99.93% | 100% |
| **Standard Deviation** | 0.2% | 0.6% | 0.5% |
| **ASTC Encoder - Medium (sec)** | **5.7949** | 5.7757 | **5.7737** |
| **Normalized** | 99.63% | 99.97% | 100% |
| **Standard Deviation** | 0.7% | 0.2% | 0.2% |
| **ASTC Encoder - Thorough (sec)** | **14.9207** | **14.9059** | 14.9103 |
| **Normalized** | 99.9% | 100% | 99.97% |
| **Standard Deviation** | 0.2% | 0.3% | 0.2% |
| **ASTC Encoder - Exhaustive (sec)** | 113.8873 | **113.7734** | **113.8933** |
| **Normalized** | 99.9% | 100% | 99.89% |
| **Standard Deviation** | 0.2% | 0.2% | 0.2% |
| **Basis Universal - ETC1S (sec)** | **23.455** | 23.390 | **23.367** |
| **Normalized** | 99.62% | 99.9% | 100% |
| **Standard Deviation** | 0.2% | 0.6% | 0.3% |
| **Basis Universal - UASTC Level 0 (sec)** | **7.172** | 7.091 | **7.089** |
| **Normalized** | 98.84% | 99.97% | 100% |
| **Standard Deviation** | 0% | 0.1% | 0.1% |
| **Basis Universal - UASTC Level 2 (sec)** | **33.461** | **33.374** | 33.387 |
| **Normalized** | 99.74% | 100% | 99.96% |
| **Standard Deviation** | 0.1% | 0.5% | 0.6% |
| **Basis Universal - UASTC Level 3 (sec)** | **63.543** | 63.560 | **63.593** |
| **Normalized** | 100% | 99.97% | 99.92% |
| **Standard Deviation** | 0.1% | 0.1% | 0.1% |
| **OpenSCAD - Pistol (sec)** | **100.767** | **100.978** | 100.813 |
| **Normalized** | 100% | 99.79% | 99.95% |
| **Standard Deviation** | 0.1% | 0.4% | 0.1% |
| **OpenSCAD - Retro Car (sec)** | **17.259** | 17.346 | **17.367** |
| **Normalized** | 100% | 99.5% | 99.38% |
| **Standard Deviation** | 0.2% | 1% | 0.2% |
| **OpenSCAD - Mini-ITX Case (sec)** | **41.908** | 42.053 | **42.084** |
| **Normalized** | 100% | 99.66% | 99.58% |
| **Standard Deviation** | 0.3% | 0.5% | 0.1% |
| **OpenSCAD - P.M.S (sec)** | **92.931** | 93.908 | **94.966** |
| **Normalized** | 100% | 98.96% | 97.86% |
| **Standard Deviation** | 0.4% | 0.8% | 0.1% |

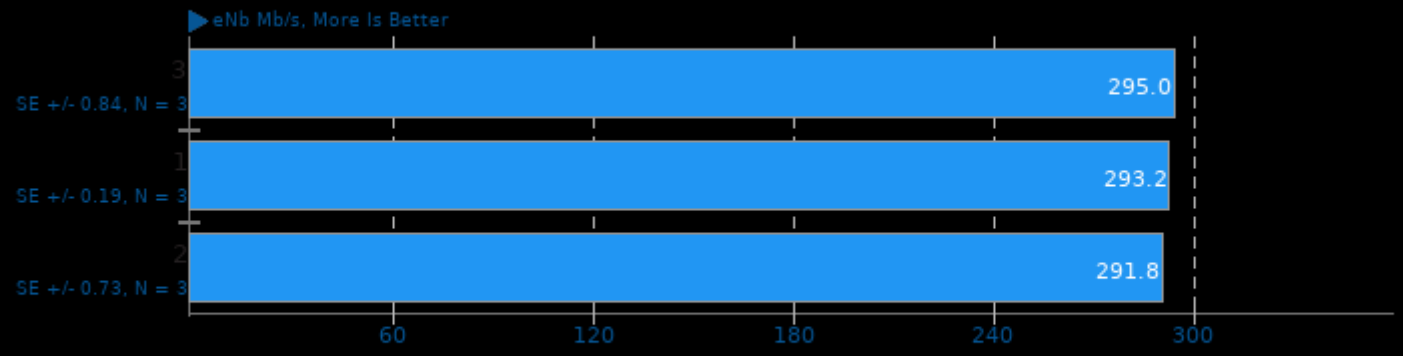
# 990KS March

| | | | |
|---|---|---|---|
| **OpenSCAD - L.P.C.S (sec)** | 16.975 | **16.941** | **17.054** |
| **Normalized** | 99.8% | 100% | 99.34% |
| **Standard Deviation** | 0.1% | 0.2% | 0.1% |

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## srsLTE 20.10.1

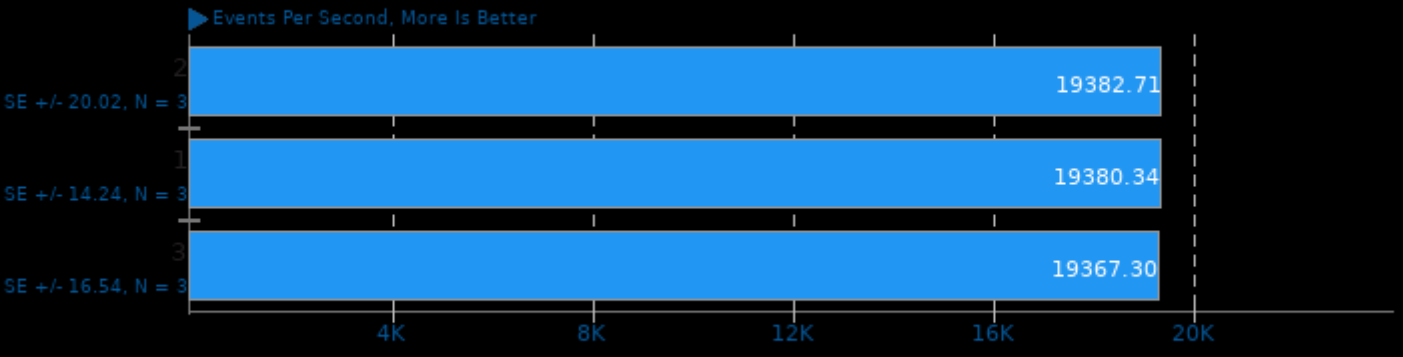
Test: PHY_DL_Test




1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

## Sysbench 1.0.20

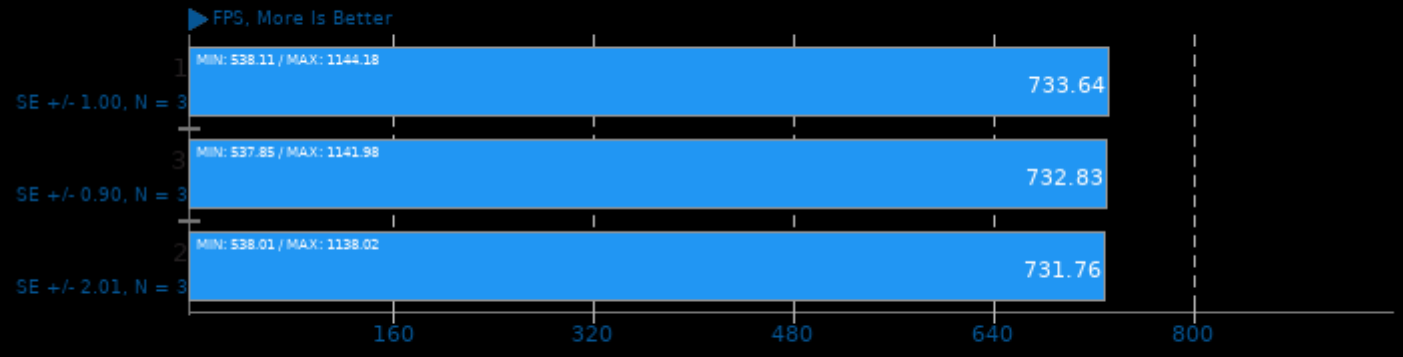
Test: CPU




1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm

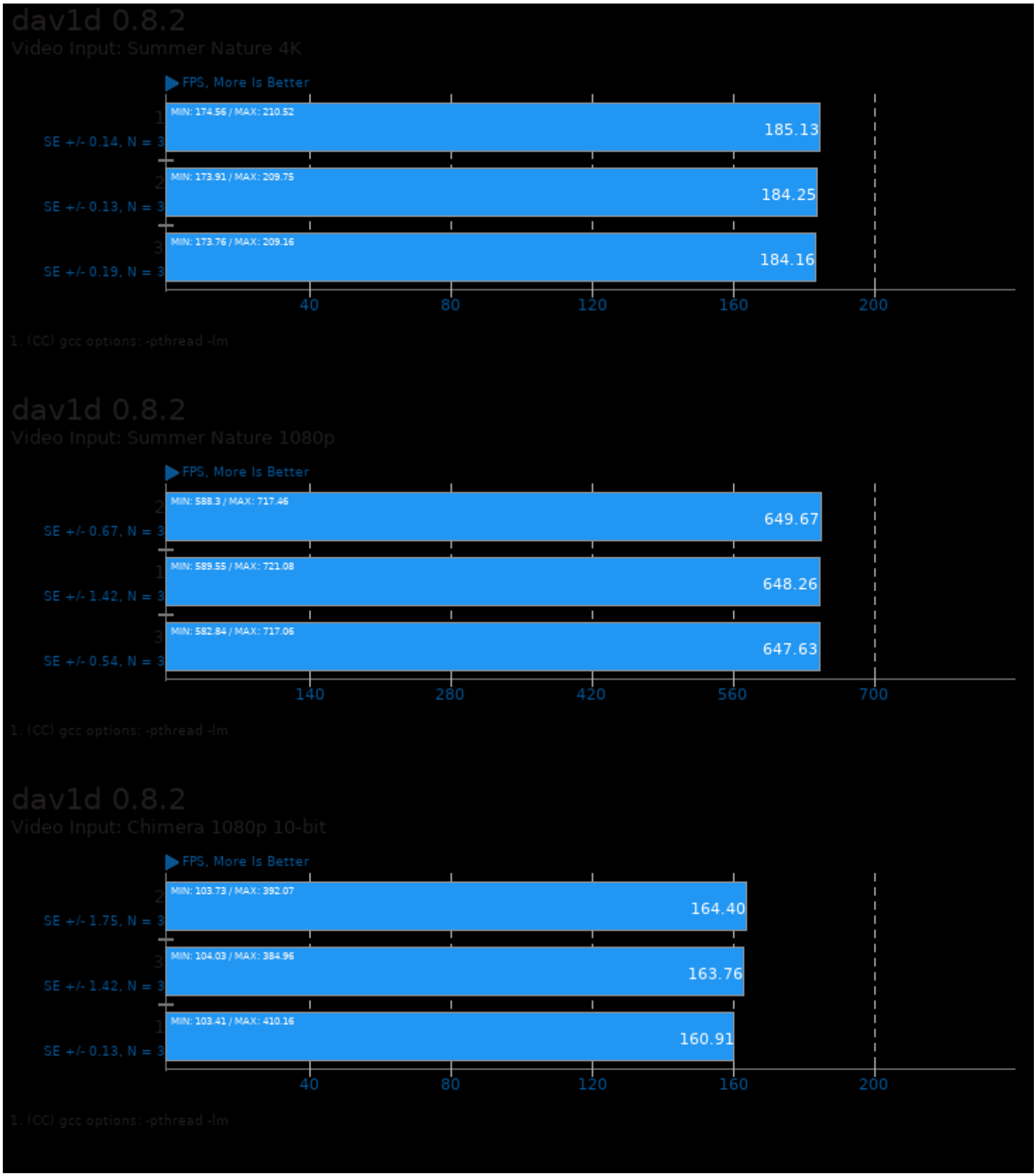
## dav1d 0.8.2

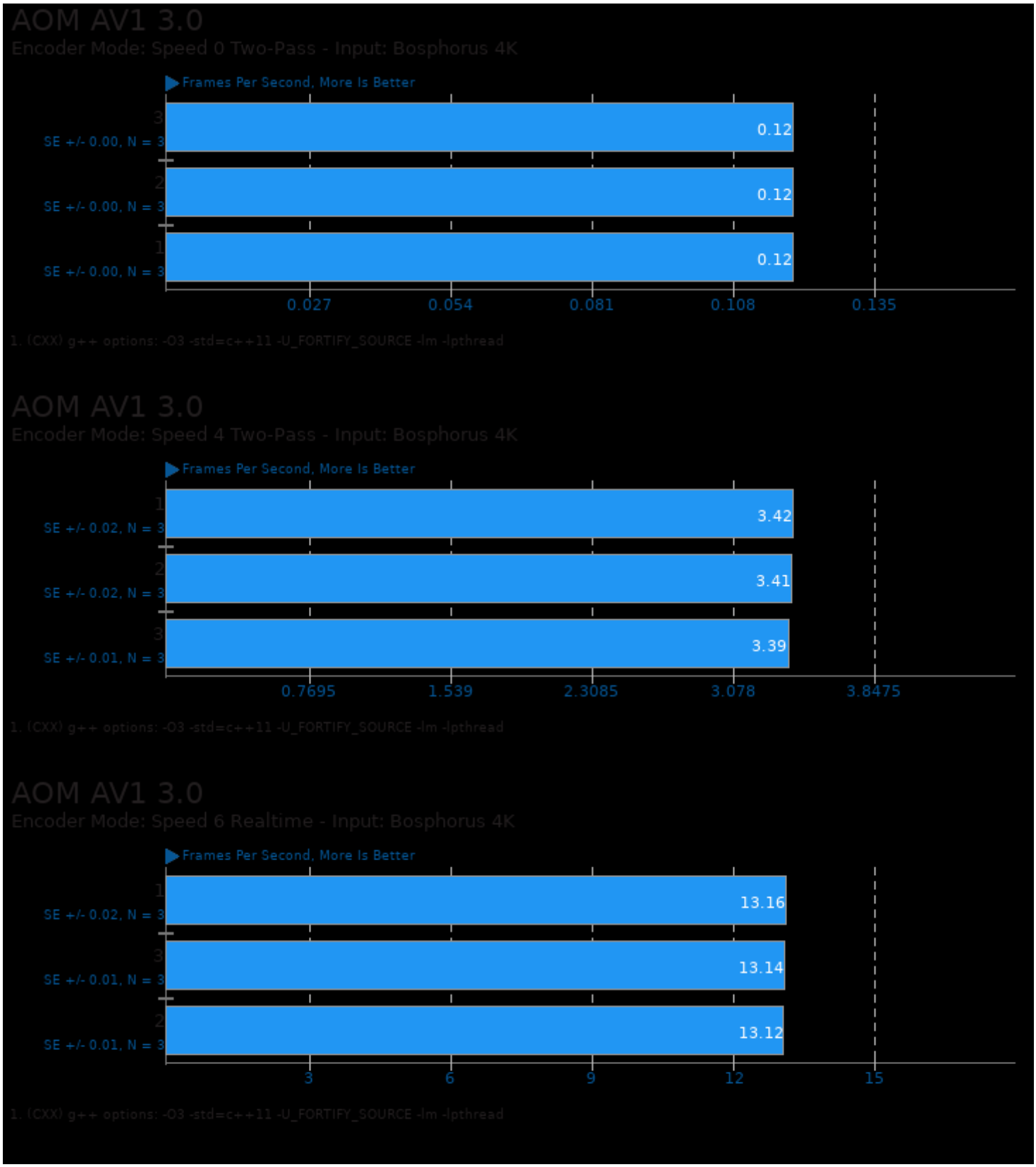
Video Input: Chimera 1080p

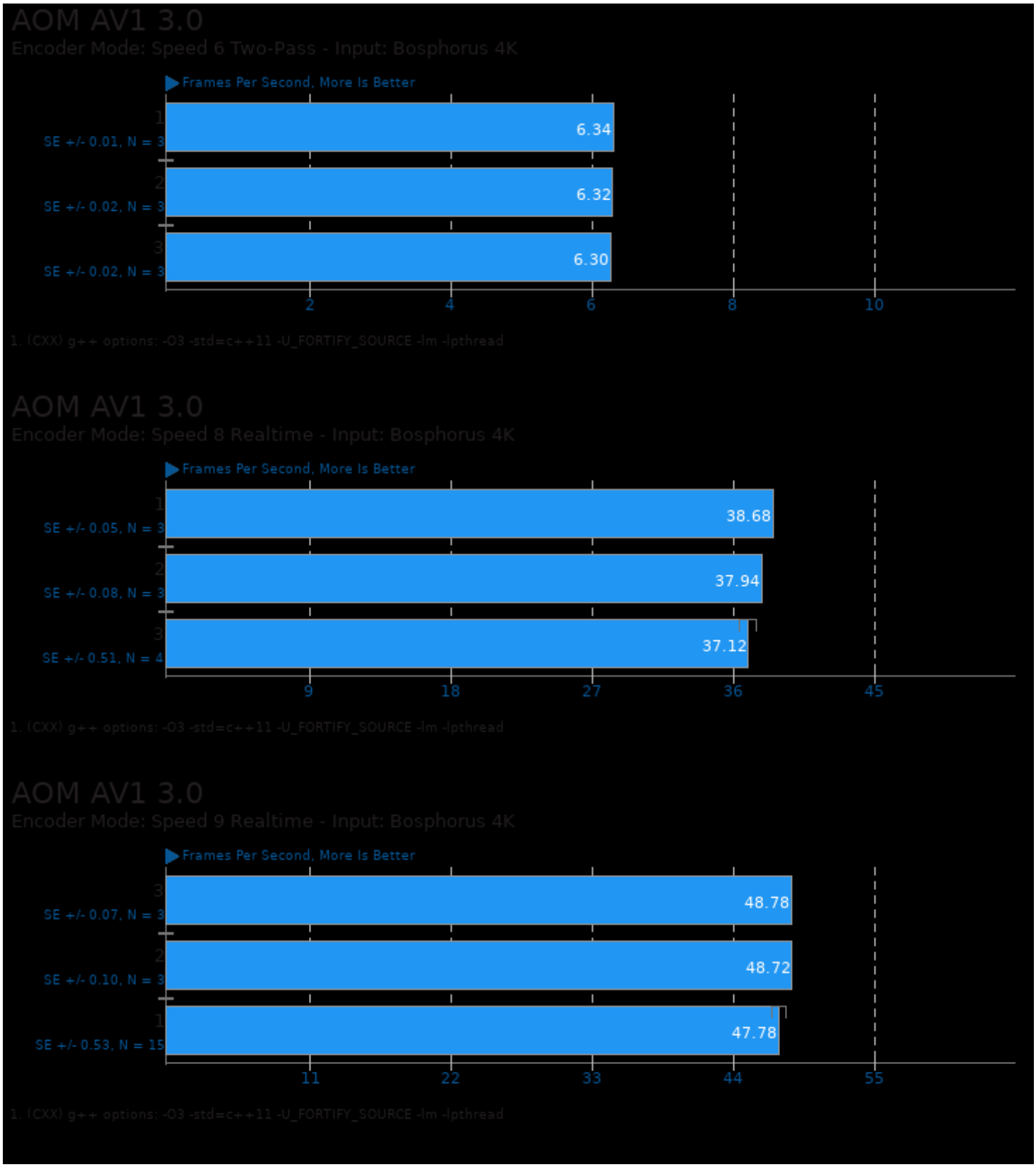


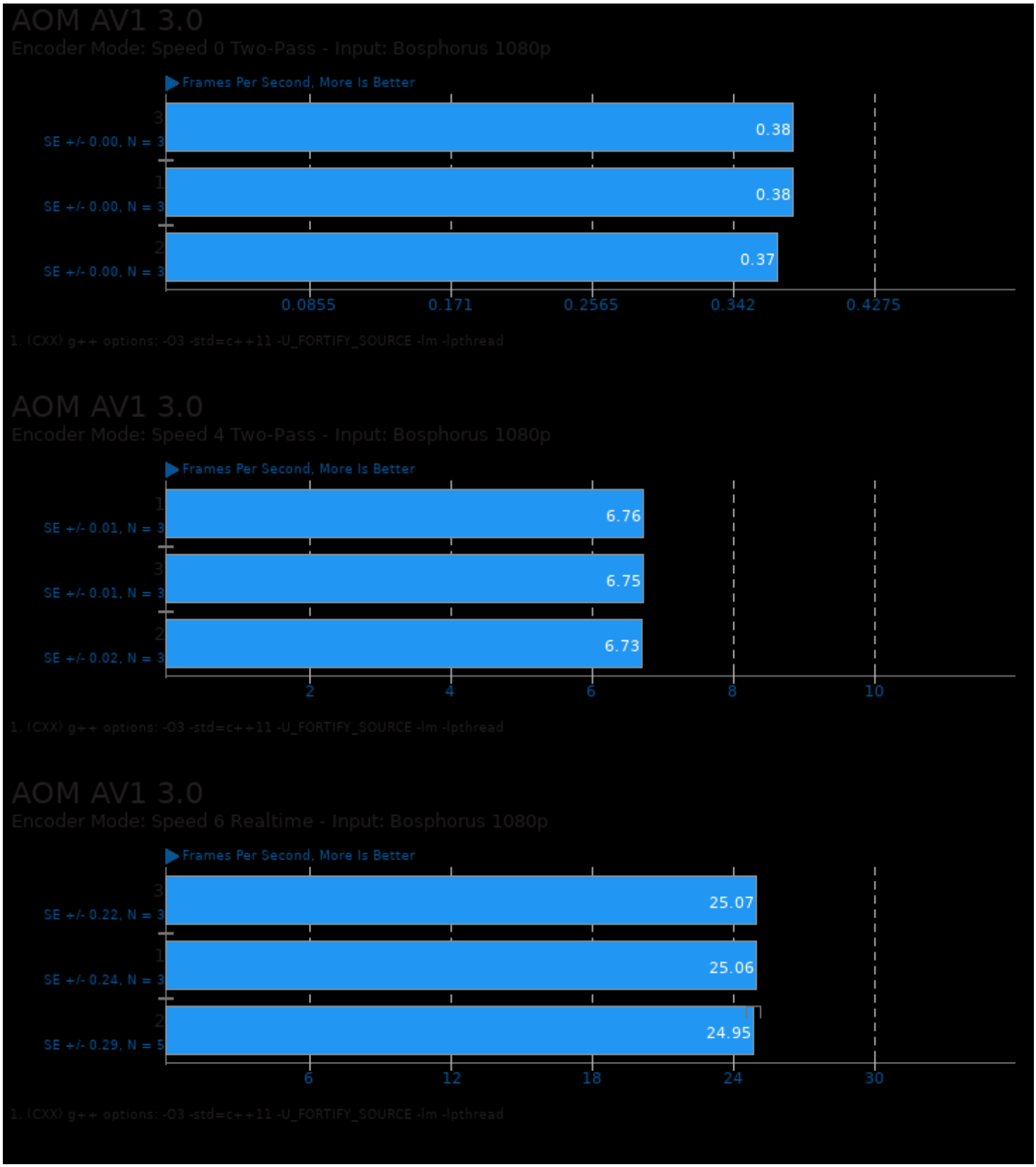

1. (CC) gcc options: -pthread -lm

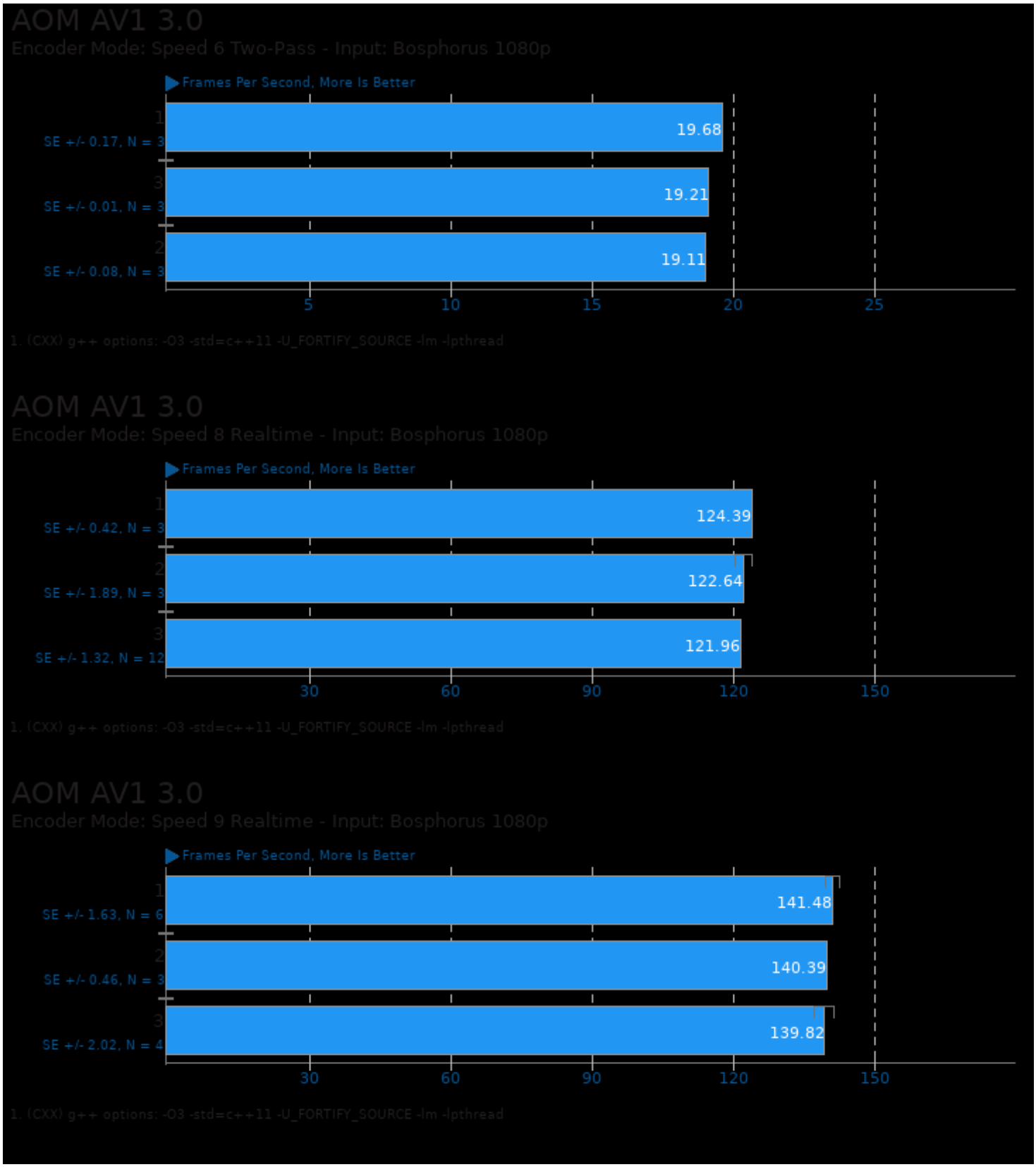
# 990KS March


dav1d 0.8.2
Video Input: Summer Nature 4K
FPS, More Is Better
1
MIN: 174.56 / MAX: 210.52
185.13
SE +/- 0.14, N = 3
2
MIN: 173.91 / MAX: 209.75
184.25
SE +/- 0.13, N = 3
3
MIN: 173.76 / MAX: 209.16
184.16
SE +/- 0.19, N = 3
40
80
120
160
200
1. (CC) gcc options: -pthread -lm
dav1d 0.8.2
Video Input: Summer Nature 1080p
FPS, More Is Better
2
MIN: 588.3 / MAX: 717.46
649.67
SE +/- 0.67, N = 3
1
MIN: 589.55 / MAX: 721.08
648.26
SE +/- 1.42, N = 3
3
MIN: 582.84 / MAX: 717.06
647.63
SE +/- 0.54, N = 3
140
280
420
560
700
1. (CC) gcc options: -pthread -lm
dav1d 0.8.2
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
2
MIN: 103.73 / MAX: 392.07
164.40
SE +/- 1.75, N = 3
3
MIN: 104.03 / MAX: 384.96
163.76
SE +/- 1.42, N = 3
1
MIN: 103.41 / MAX: 410.16
160.91
SE +/- 0.13, N = 3
40
80
120
160
200
1. (CC) gcc options: -pthread -lm

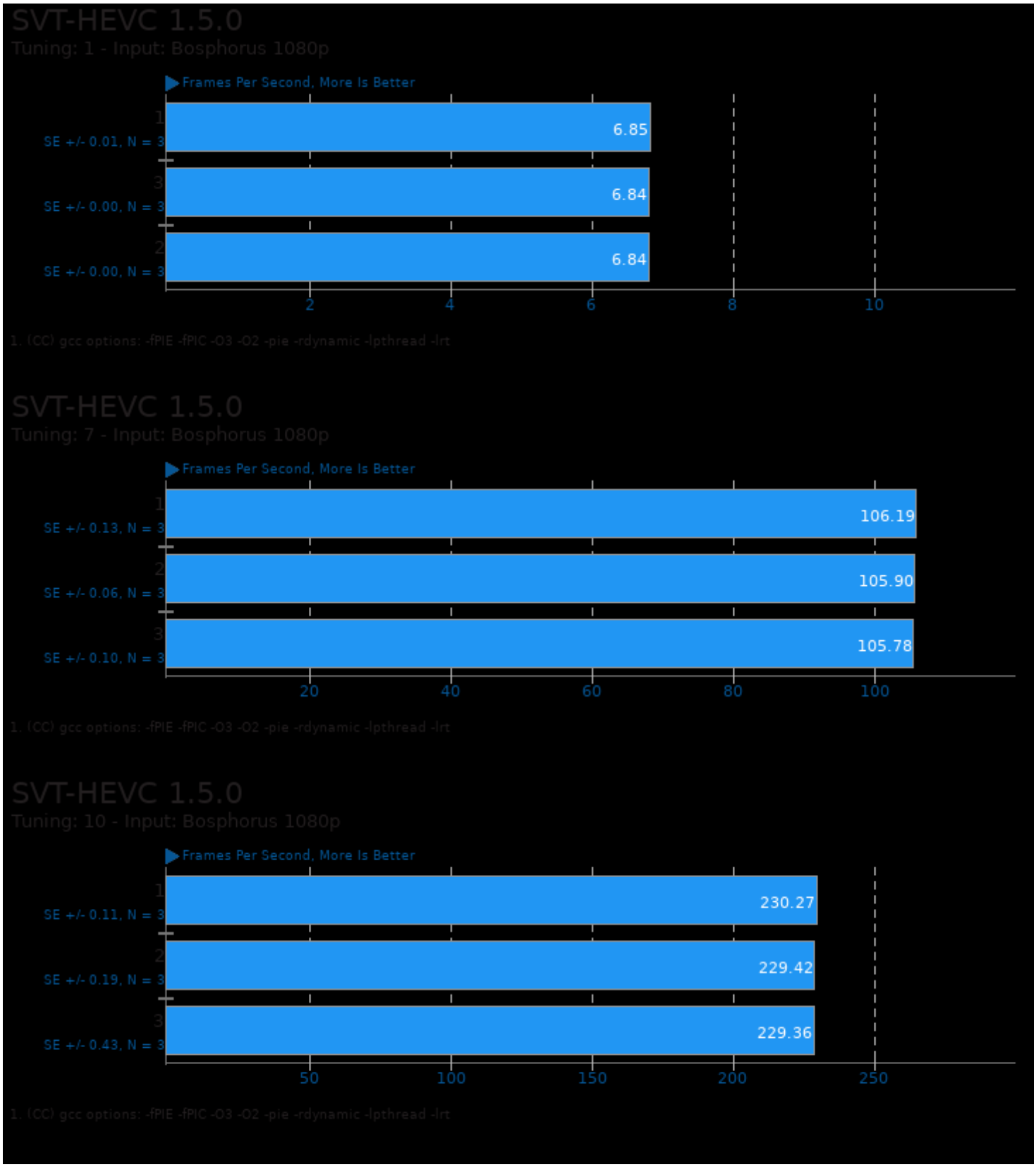

AOM AV1 3.0
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
3
SE +/- 0.00, N = 3
0.12
2
SE +/- 0.00, N = 3
0.12
1
SE +/- 0.00, N = 3
0.12
0.027
0.054
0.081
0.108
0.135
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
1
SE +/- 0.02, N = 3
3.42
2
SE +/- 0.02, N = 3
3.41
3
SE +/- 0.01, N = 3
3.39
0.7695
1.539
2.3085
3.078
3.8475
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
1
SE +/- 0.02, N = 3
13.16
3
SE +/- 0.01, N = 3
13.14
2
SE +/- 0.01, N = 3
13.12
3
6
9
12
15
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread


AOM AV1 3.0
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
1
SE +/- 0.01, N = 3
6.34
2
SE +/- 0.02, N = 3
6.32
3
SE +/- 0.02, N = 3
6.30
2
4
6
8
10
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
1
SE +/- 0.05, N = 3
38.68
2
SE +/- 0.08, N = 3
37.94
3
SE +/- 0.51, N = 4
37.12
9
18
27
36
45
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
3
SE +/- 0.07, N = 3
48.78
2
SE +/- 0.10, N = 3
48.72
1
SE +/- 0.53, N = 15
47.78
11
22
33
44
55
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

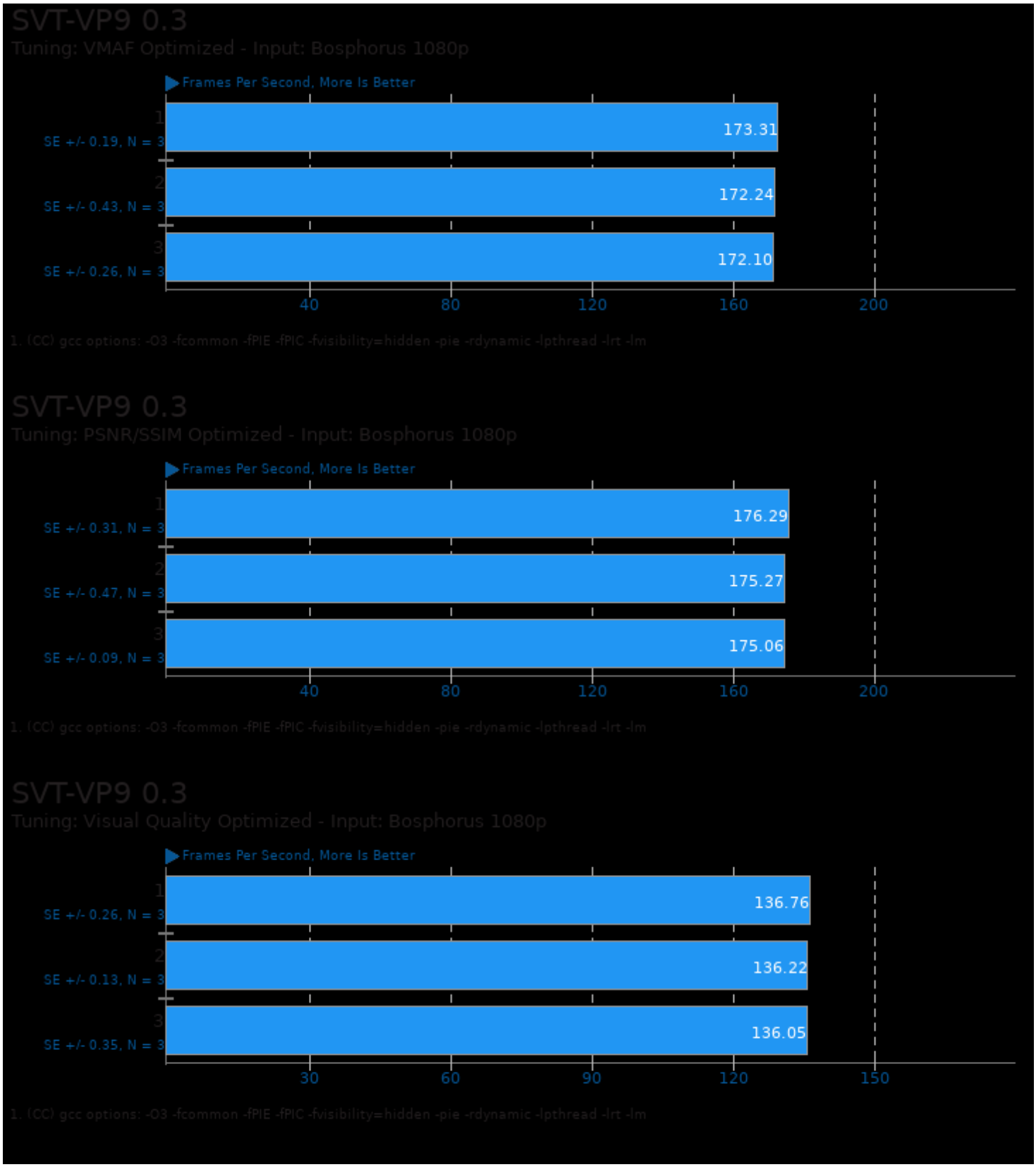

AOM AV1 3.0
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
3
SE +/- 0.00, N = 3
0.38
1
SE +/- 0.00, N = 3
0.38
2
SE +/- 0.00, N = 3
0.37
0.0855
0.171
0.2565
0.342
0.4275
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.01, N = 3
6.76
3
SE +/- 0.01, N = 3
6.75
2
SE +/- 0.02, N = 3
6.73
2
4
6
8
10
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
3
SE +/- 0.22, N = 3
25.07
1
SE +/- 0.24, N = 3
25.06
2
SE +/- 0.29, N = 5
24.95
6
12
18
24
30
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

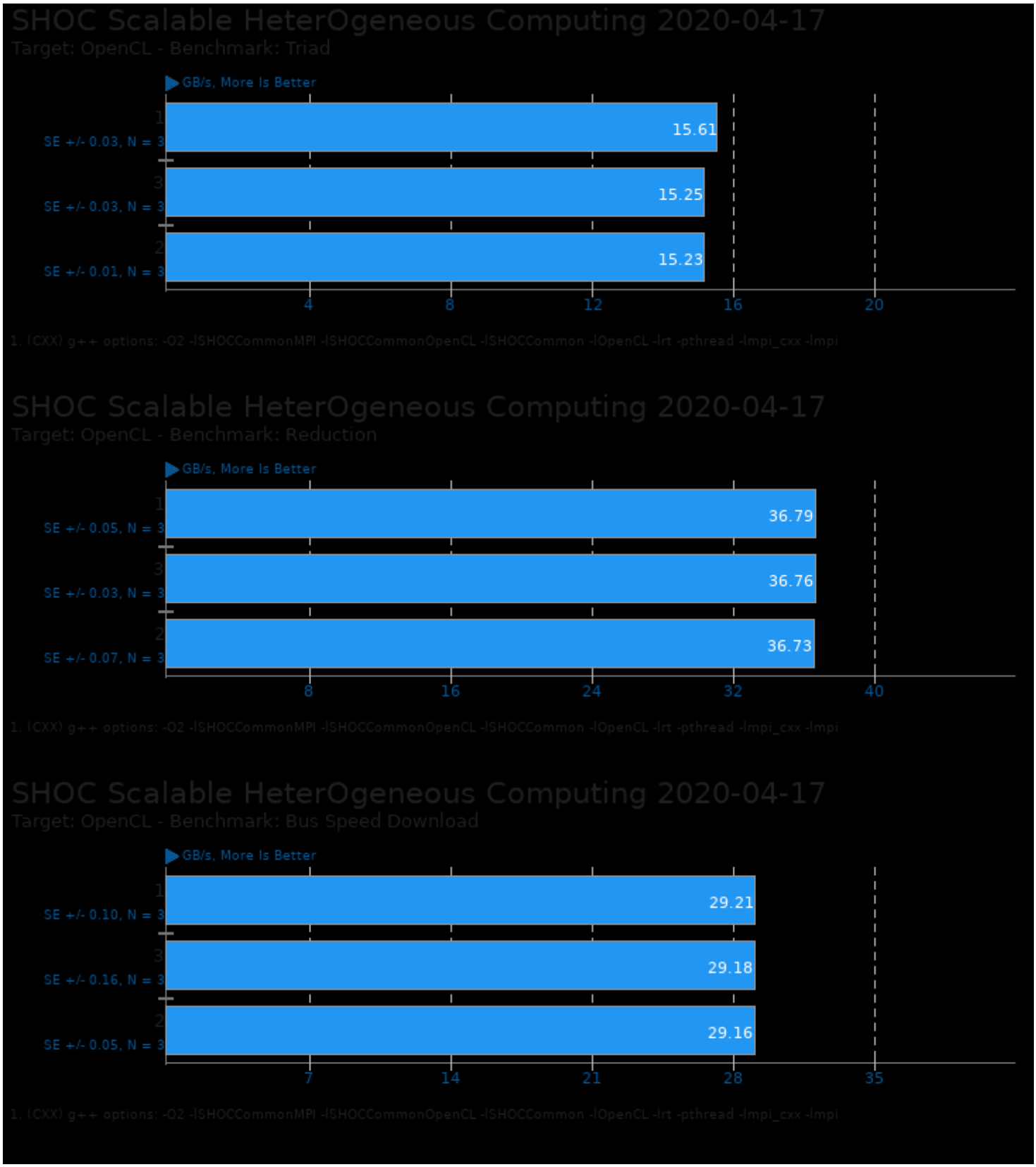

AOM AV1 3.0
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.17, N = 3
19.68
3
SE +/- 0.01, N = 3
19.21
2
SE +/- 0.08, N = 3
19.11
5
10
15
20
25
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.42, N = 3
124.39
2
SE +/- 1.89, N = 3
122.64
3
SE +/- 1.32, N = 12
121.96
30
60
90
120
150
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 1.63, N = 6
141.48
2
SE +/- 0.46, N = 3
140.39
3
SE +/- 2.02, N = 4
139.82
30
60
90
120
150
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

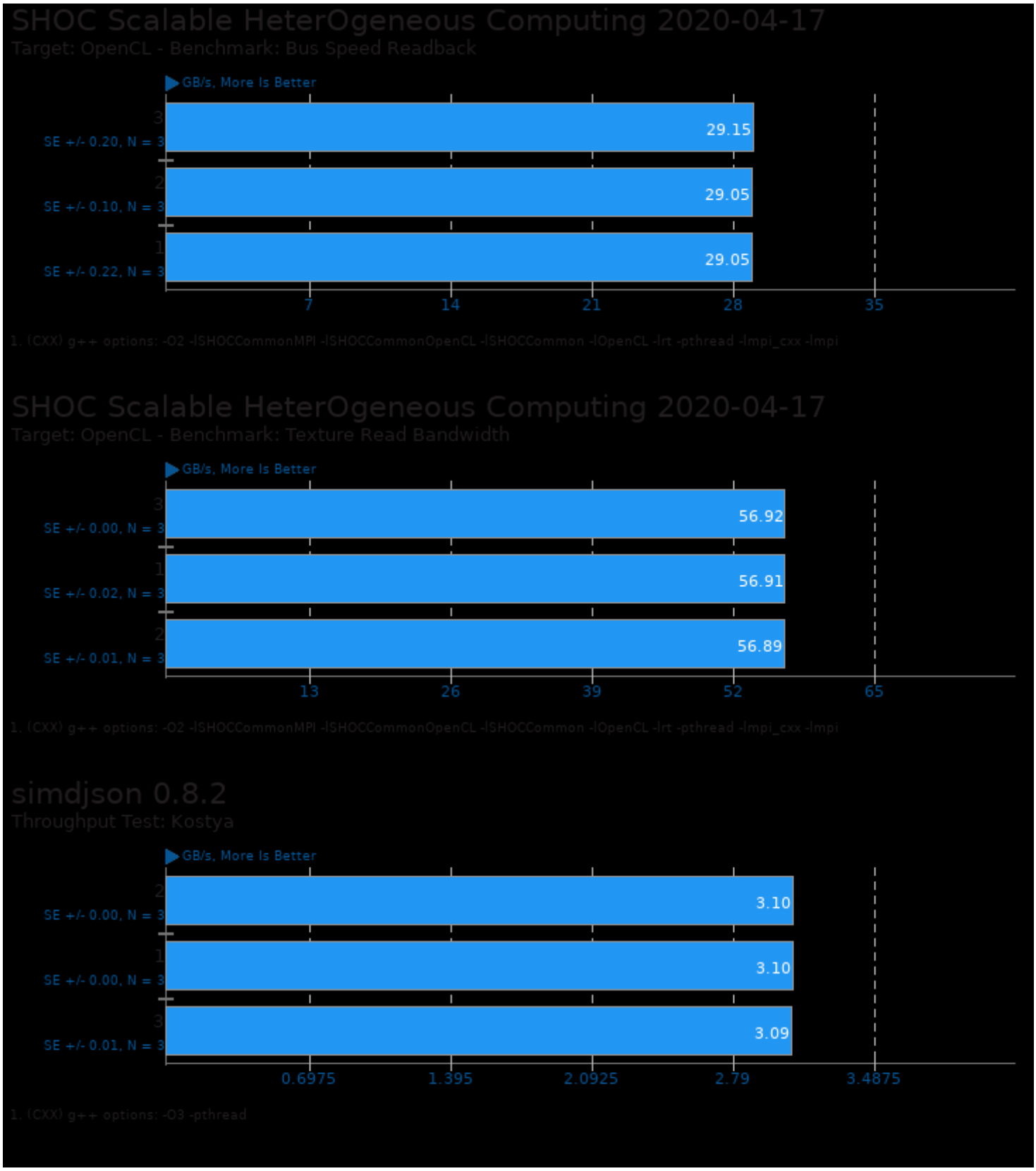
# 990KS March


SVT-HEVC 1.5.0
Tuning: 1 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.01, N = 3
6.85
3
SE +/- 0.00, N = 3
6.84
2
SE +/- 0.00, N = 3
6.84
2
4
6
8
10
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt
SVT-HEVC 1.5.0
Tuning: 7 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.13, N = 3
106.19
2
SE +/- 0.06, N = 3
105.90
3
SE +/- 0.10, N = 3
105.78
20
40
60
80
100
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt
SVT-HEVC 1.5.0
Tuning: 10 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.11, N = 3
230.27
2
SE +/- 0.19, N = 3
229.42
3
SE +/- 0.43, N = 3
229.36
50
100
150
200
250
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt

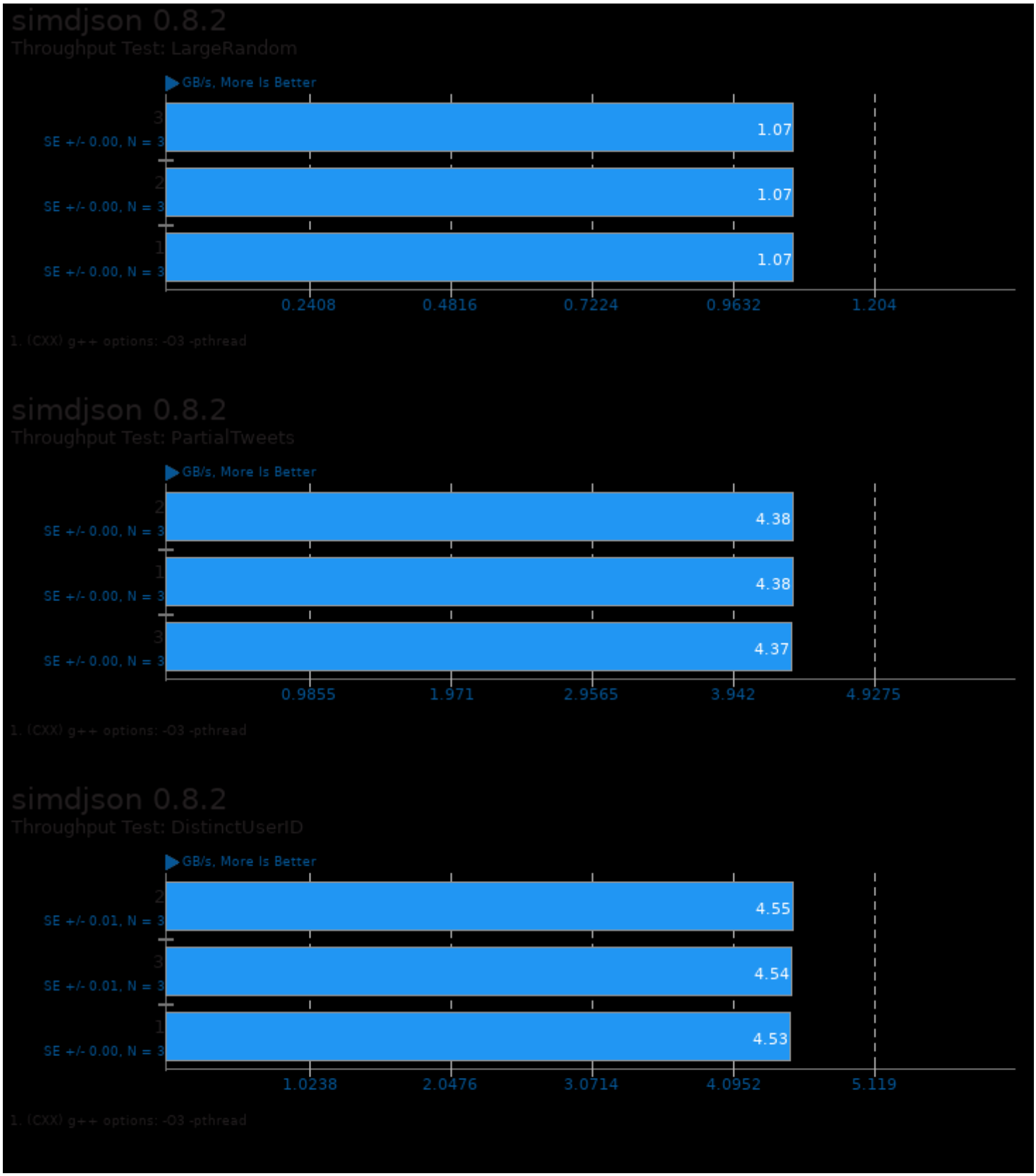
# 990KS March


SVT-VP9 0.3
Tuning: VMAF Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.19, N = 3
173.31
2
SE +/- 0.43, N = 3
172.24
3
SE +/- 0.26, N = 3
172.10
40
80
120
160
200
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm
SVT-VP9 0.3
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.31, N = 3
176.29
2
SE +/- 0.47, N = 3
175.27
3
SE +/- 0.09, N = 3
175.06
40
80
120
160
200
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm
SVT-VP9 0.3
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
1
SE +/- 0.26, N = 3
136.76
2
SE +/- 0.13, N = 3
136.22
3
SE +/- 0.35, N = 3
136.05
30
60
90
120
150
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

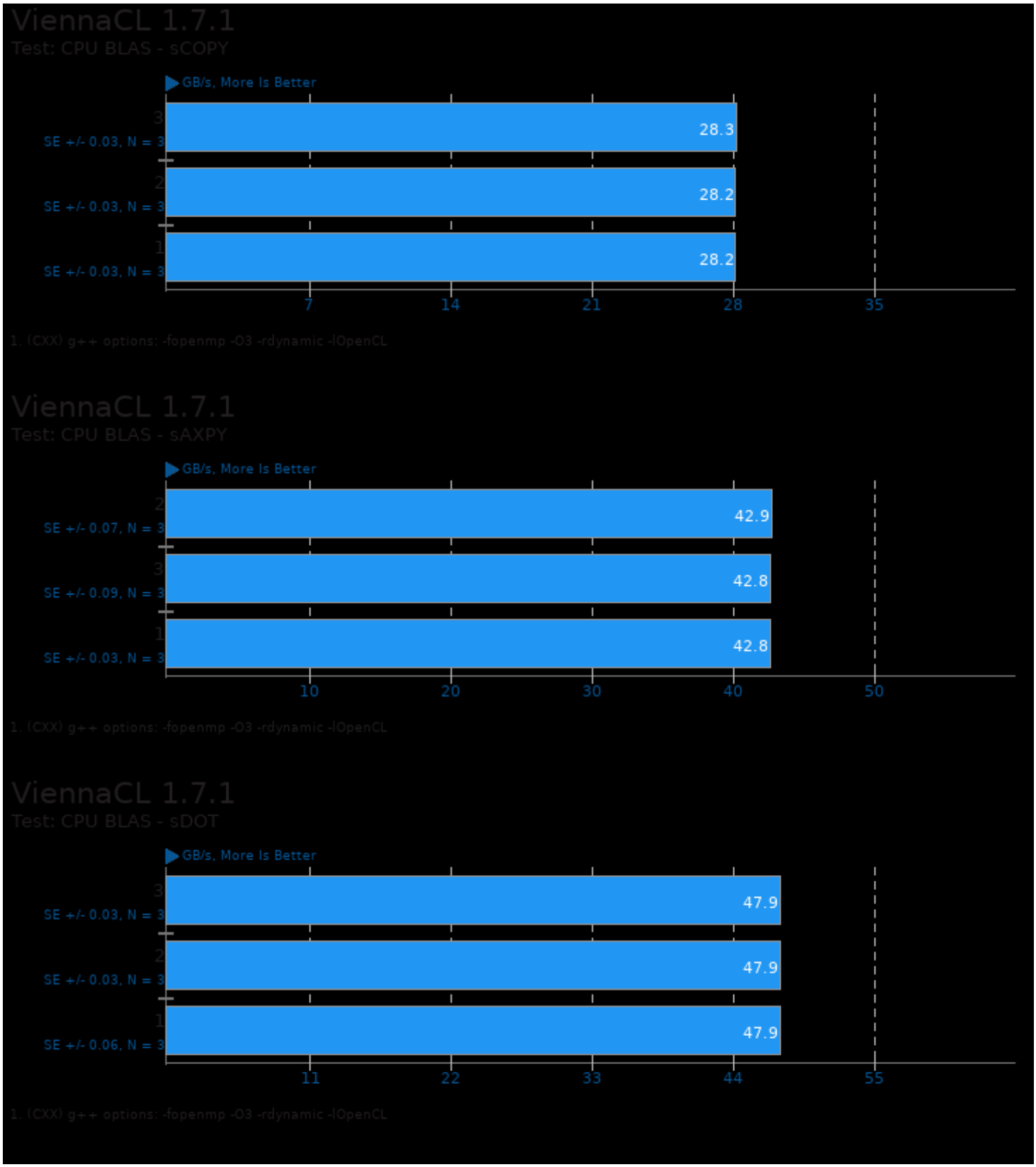

SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Triad
GB/s, More Is Better
1
SE +/- 0.03, N = 3
15.61
3
SE +/- 0.03, N = 3
15.25
2
SE +/- 0.01, N = 3
15.23
4
8
12
16
20
1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Reduction
GB/s, More Is Better
1
SE +/- 0.05, N = 3
36.79
3
SE +/- 0.03, N = 3
36.76
2
SE +/- 0.07, N = 3
36.73
8
16
24
32
40
1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Bus Speed Download
GB/s, More Is Better
1
SE +/- 0.10, N = 3
29.21
3
SE +/- 0.16, N = 3
29.18
2
SE +/- 0.05, N = 3
29.16
7
14
21
28
35
1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi


SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Bus Speed Readback
GB/s, More Is Better
SE +/- 0.20, N = 3
29.15
SE +/- 0.10, N = 3
29.05
SE +/- 0.22, N = 3
29.05
7
14
21
28
35
1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Texture Read Bandwidth
GB/s, More Is Better
SE +/- 0.00, N = 3
56.92
SE +/- 0.02, N = 3
56.91
SE +/- 0.01, N = 3
56.89
13
26
39
52
65
1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi
simdjson 0.8.2
Throughput Test: Kostya
GB/s, More Is Better
SE +/- 0.00, N = 3
3.10
SE +/- 0.00, N = 3
3.10
SE +/- 0.01, N = 3
3.09
0.6975
1.395
2.0925
2.79
3.4875
1. (CXX) g++ options: -O3 -pthread

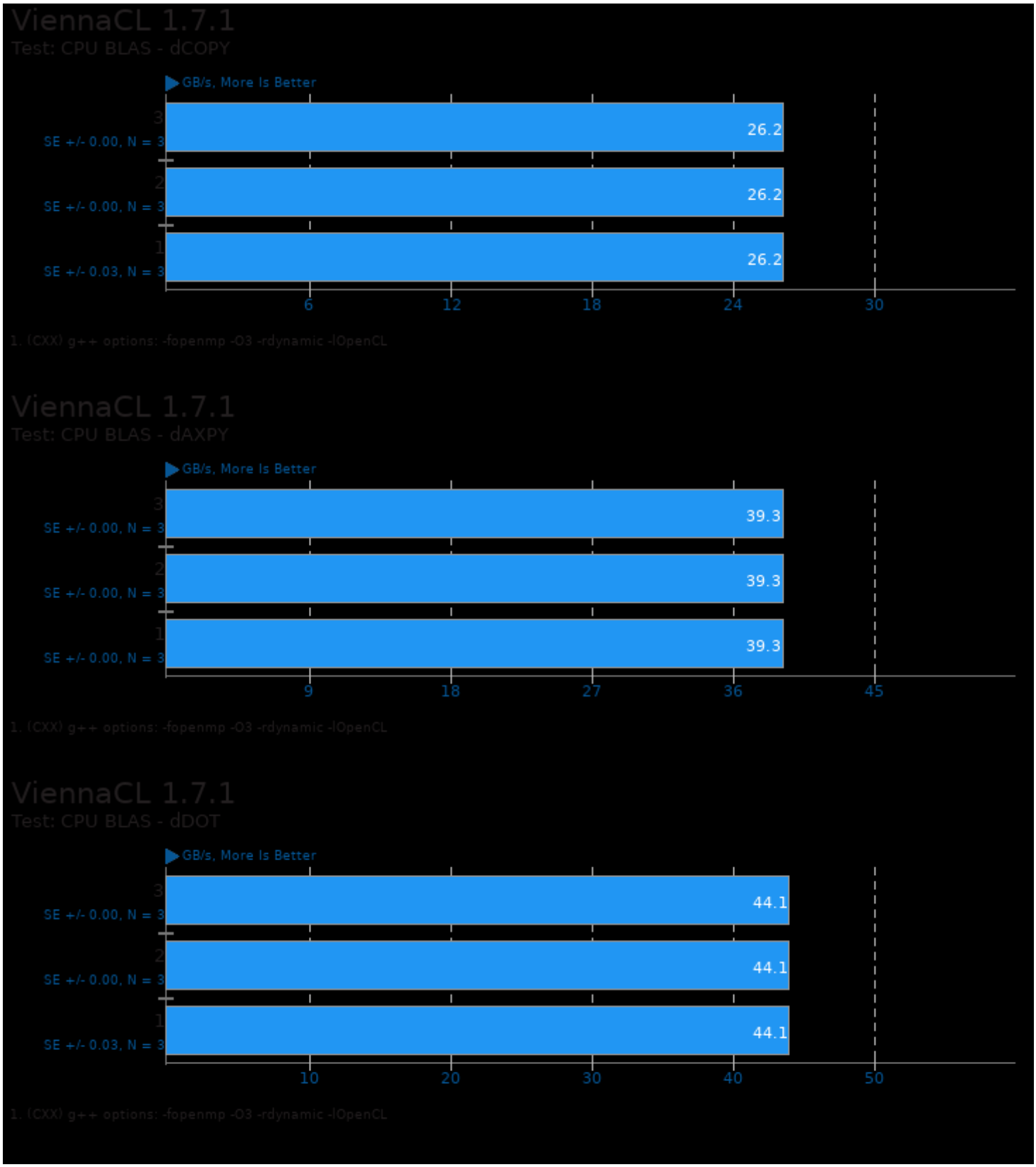
# 990KS March


simdjson 0.8.2
Throughput Test: LargeRandom
GB/s, More Is Better
3
SE +/- 0.00, N = 3
1.07
2
SE +/- 0.00, N = 3
1.07
1
SE +/- 0.00, N = 3
1.07
0.2408
0.4816
0.7224
0.9632
1.204
1. (CXX) g++ options: -O3 -pthread
simdjson 0.8.2
Throughput Test: PartialTweets
GB/s, More Is Better
2
SE +/- 0.00, N = 3
4.38
1
SE +/- 0.00, N = 3
4.38
3
SE +/- 0.00, N = 3
4.37
0.9855
1.971
2.9565
3.942
4.9275
1. (CXX) g++ options: -O3 -pthread
simdjson 0.8.2
Throughput Test: DistinctUserID
GB/s, More Is Better
2
SE +/- 0.01, N = 3
4.55
3
SE +/- 0.01, N = 3
4.54
1
SE +/- 0.00, N = 3
4.53
1.0238
2.0476
3.0714
4.0952
5.119
1. (CXX) g++ options: -O3 -pthread

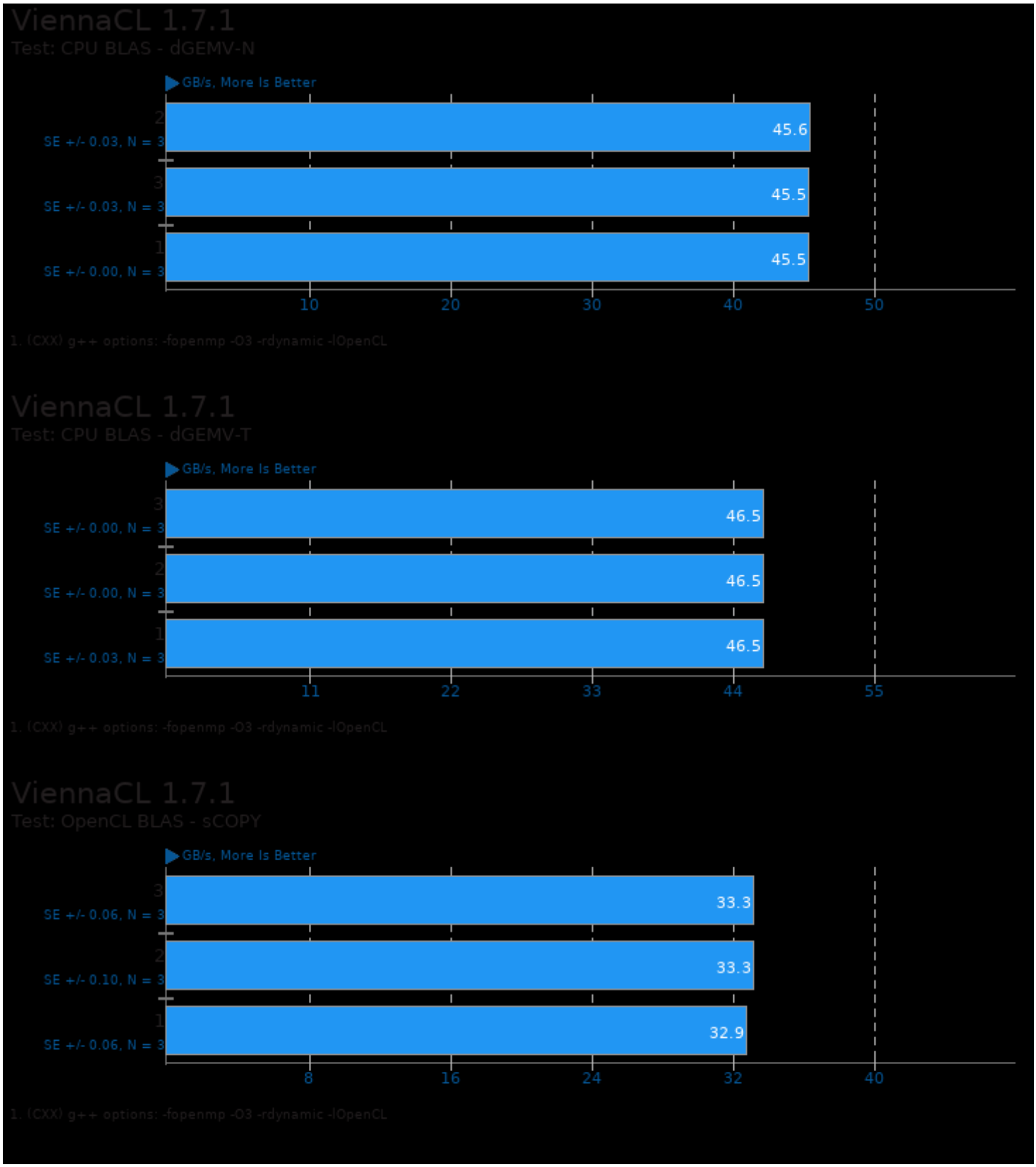
# 990KS March

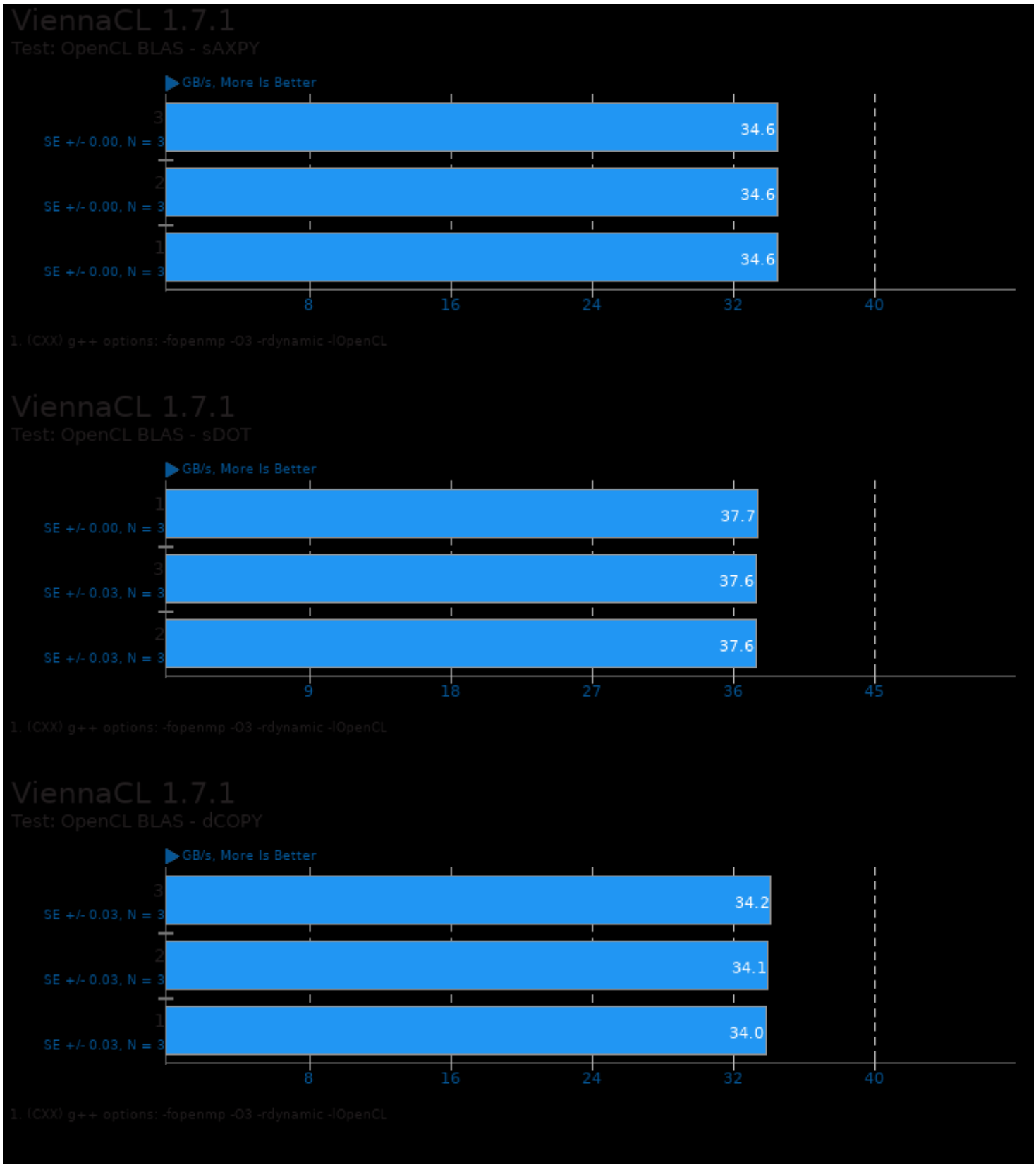

ViennaCL 1.7.1
Test: CPU BLAS - sCOPY
GB/s, More Is Better
3
SE +/- 0.03, N = 3
28.3
2
SE +/- 0.03, N = 3
28.2
1
SE +/- 0.03, N = 3
28.2
7
14
21
28
35
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - sAXPY
GB/s, More Is Better
2
SE +/- 0.07, N = 3
42.9
3
SE +/- 0.09, N = 3
42.8
1
SE +/- 0.03, N = 3
42.8
10
20
30
40
50
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - sDOT
GB/s, More Is Better
3
SE +/- 0.03, N = 3
47.9
2
SE +/- 0.03, N = 3
47.9
1
SE +/- 0.06, N = 3
47.9
11
22
33
44
55
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

# 990KS March

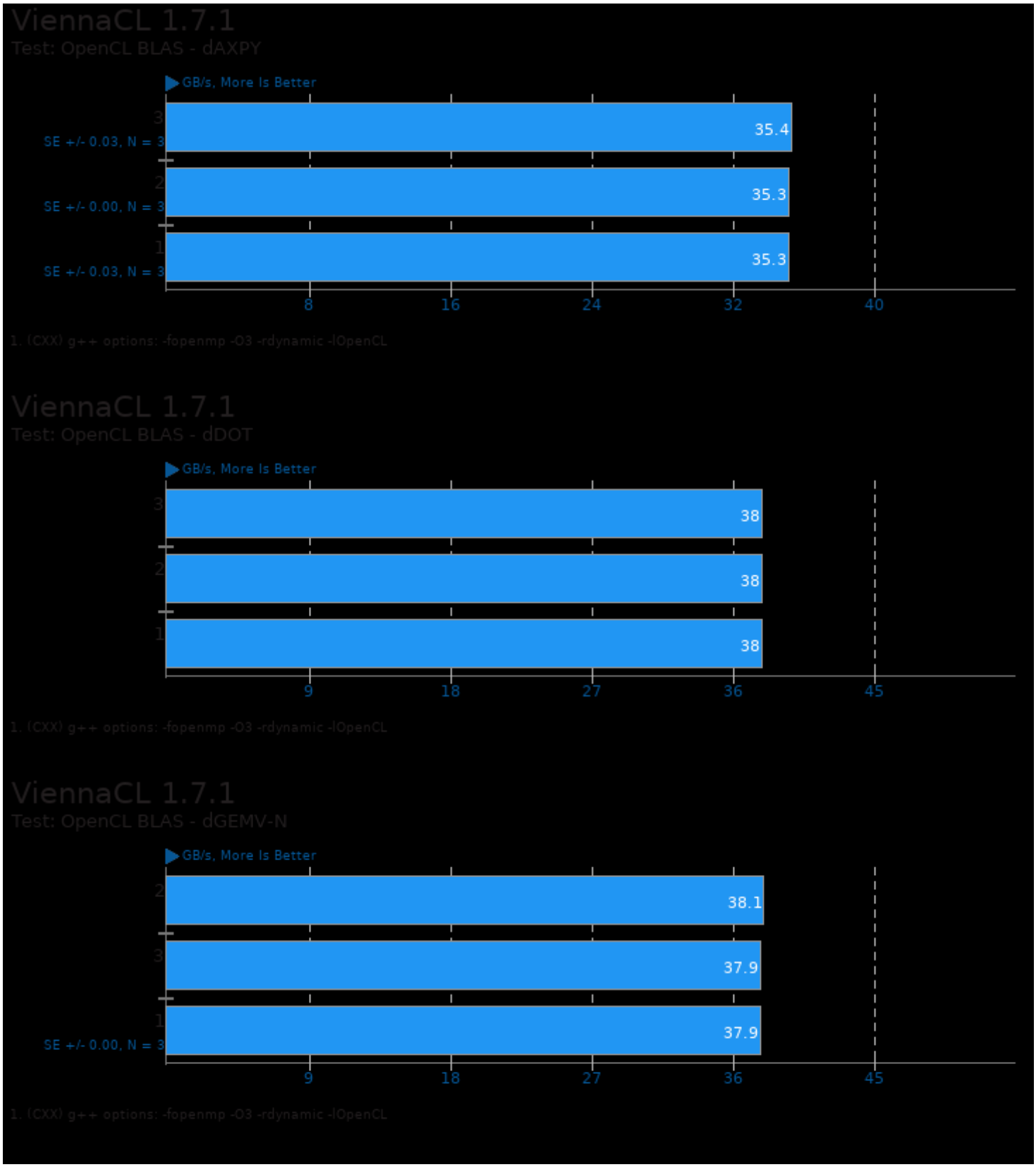

ViennaCL 1.7.1
Test: CPU BLAS - dCOPY
GB/s, More Is Better
3
SE +/- 0.00, N = 3
26.2
2
SE +/- 0.00, N = 3
26.2
1
SE +/- 0.03, N = 3
26.2
6
12
18
24
30
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dAXPY
GB/s, More Is Better
3
SE +/- 0.00, N = 3
39.3
2
SE +/- 0.00, N = 3
39.3
1
SE +/- 0.00, N = 3
39.3
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dDOT
GB/s, More Is Better
3
SE +/- 0.00, N = 3
44.1
2
SE +/- 0.00, N = 3
44.1
1
SE +/- 0.03, N = 3
44.1
10
20
30
40
50
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

# 990KS March


ViennaCL 1.7.1
Test: CPU BLAS - dGEMV-N
GB/s, More Is Better
2
SE +/- 0.03, N = 3
45.6
3
SE +/- 0.03, N = 3
45.5
1
SE +/- 0.00, N = 3
45.5
10
20
30
40
50
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMV-T
GB/s, More Is Better
3
SE +/- 0.00, N = 3
46.5
2
SE +/- 0.00, N = 3
46.5
1
SE +/- 0.03, N = 3
46.5
11
22
33
44
55
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: OpenCL BLAS - sCOPY
GB/s, More Is Better
3
SE +/- 0.06, N = 3
33.3
2
SE +/- 0.10, N = 3
33.3
1
SE +/- 0.06, N = 3
32.9
8
16
24
32
40
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

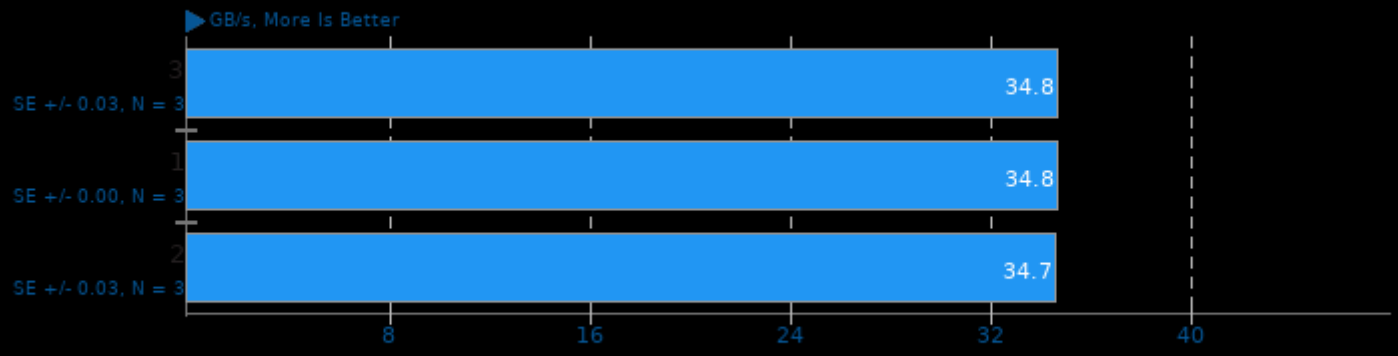

ViennaCL 1.7.1
Test: OpenCL BLAS - sAXPY
GB/s, More Is Better
3
SE +/- 0.00, N = 3
34.6
2
SE +/- 0.00, N = 3
34.6
1
SE +/- 0.00, N = 3
34.6
8
16
24
32
40
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: OpenCL BLAS - sDOT
GB/s, More Is Better
1
SE +/- 0.00, N = 3
37.7
3
SE +/- 0.03, N = 3
37.6
2
SE +/- 0.03, N = 3
37.6
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: OpenCL BLAS - dCOPY
GB/s, More Is Better
3
SE +/- 0.03, N = 3
34.2
2
SE +/- 0.03, N = 3
34.1
1
SE +/- 0.03, N = 3
34.0
8
16
24
32
40
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

# 990KS March


ViennaCL 1.7.1
Test: OpenCL BLAS - dAXPY
GB/s, More Is Better
3
SE +/- 0.03, N = 3
35.4
2
SE +/- 0.00, N = 3
35.3
1
SE +/- 0.03, N = 3
35.3
8
16
24
32
40
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: OpenCL BLAS - dDOT
GB/s, More Is Better
3
38
2
38
1
38
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: OpenCL BLAS - dGEMV-N
GB/s, More Is Better
2
38.1
3
37.9
1
SE +/- 0.00, N = 3
37.9
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

## ViennaCL 1.7.1

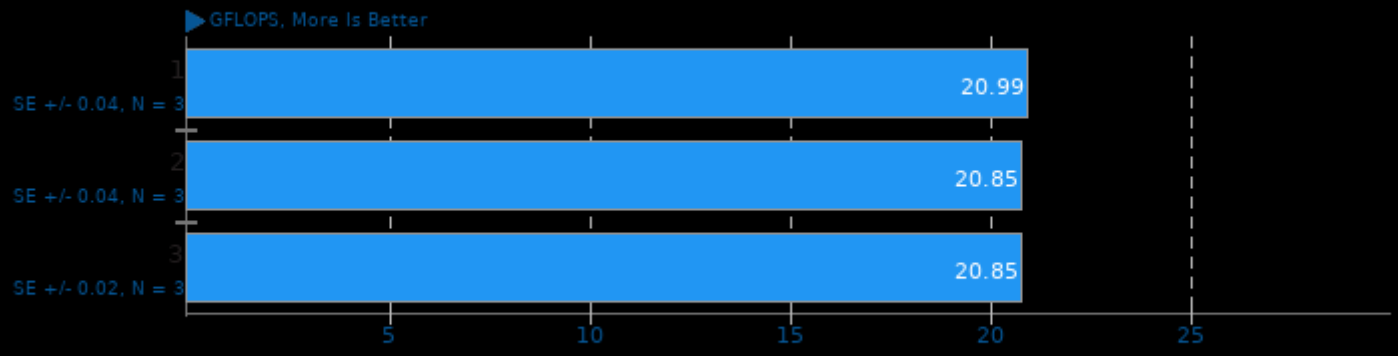
Test: OpenCL BLAS - dGEMV-T




1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

## SHOC Scalable HeterOgeneous Computing 2020-04-17

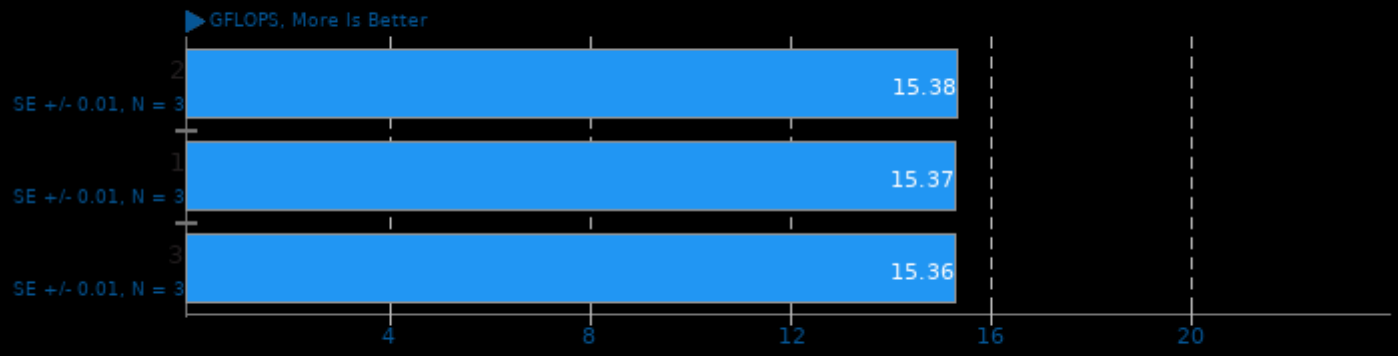
Target: OpenCL - Benchmark: S3D



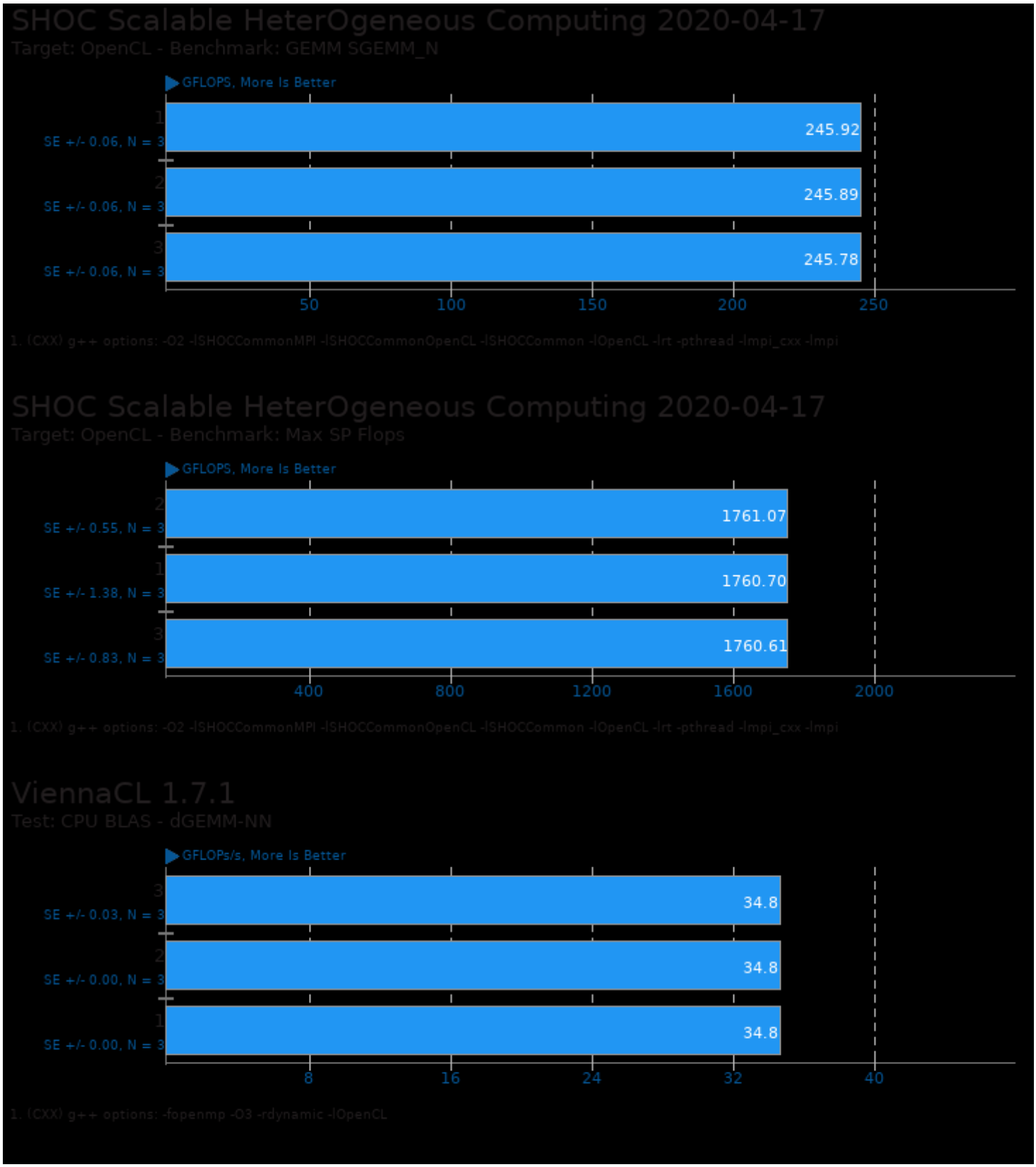

1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi

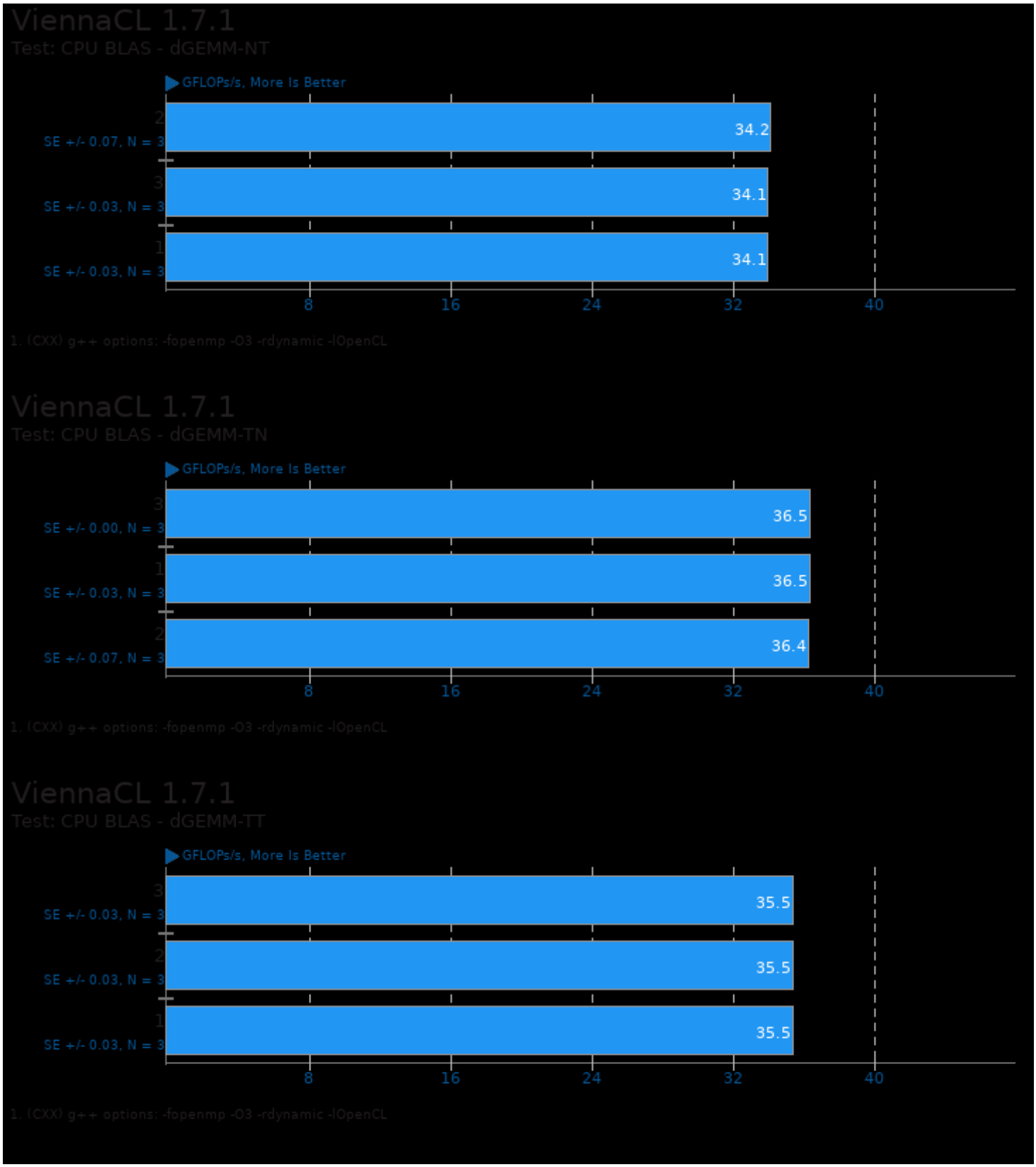
## SHOC Scalable HeterOgeneous Computing 2020-04-17

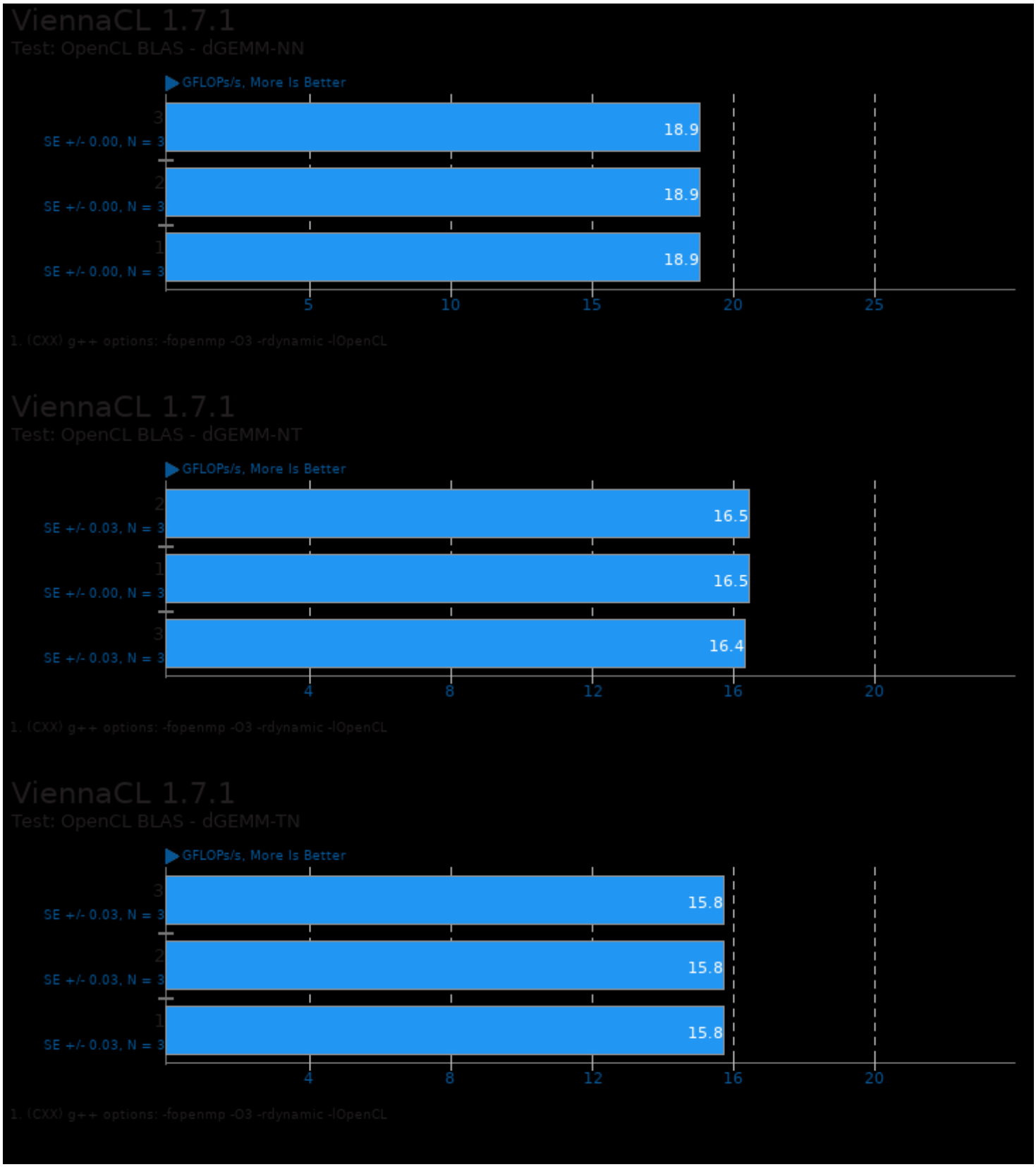
Target: OpenCL - Benchmark: FFT SP




1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi

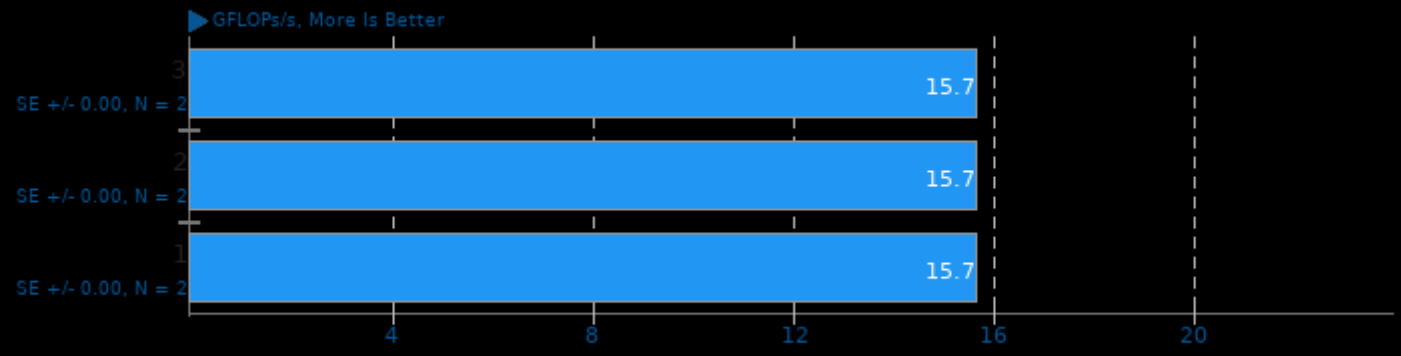

SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: GEMM SGEMM_N
GFLOPS, More Is Better
1
SE +/- 0.06, N = 3
245.92
2
SE +/- 0.06, N = 3
245.89
3
SE +/- 0.06, N = 3
245.78
50
100
150
200
250
1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi
SHOC Scalable HeterOgeneous Computing 2020-04-17
Target: OpenCL - Benchmark: Max SP Flops
GFLOPS, More Is Better
2
SE +/- 0.55, N = 3
1761.07
1
SE +/- 1.38, N = 3
1760.70
3
SE +/- 0.83, N = 3
1760.61
400
800
1200
1600
2000
1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-NN
GFLOPs/s, More Is Better
3
SE +/- 0.03, N = 3
34.8
2
SE +/- 0.00, N = 3
34.8
1
SE +/- 0.00, N = 3
34.8
8
16
24
32
40
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL


ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-NT
GFLOPs/s, More Is Better
2
SE +/- 0.07, N = 3
34.2
3
SE +/- 0.03, N = 3
34.1
1
SE +/- 0.03, N = 3
34.1
8
16
24
32
40
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-TN
GFLOPs/s, More Is Better
3
SE +/- 0.00, N = 3
36.5
1
SE +/- 0.03, N = 3
36.5
2
SE +/- 0.07, N = 3
36.4
8
16
24
32
40
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-TT
GFLOPs/s, More Is Better
3
SE +/- 0.03, N = 3
35.5
2
SE +/- 0.03, N = 3
35.5
1
SE +/- 0.03, N = 3
35.5
8
16
24
32
40
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL


ViennaCL 1.7.1
Test: OpenCL BLAS - dGEMM-NN
GFLOPs/s, More Is Better
3
SE +/- 0.00, N = 3
18.9
2
SE +/- 0.00, N = 3
18.9
1
SE +/- 0.00, N = 3
18.9
5
10
15
20
25
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: OpenCL BLAS - dGEMM-NT
GFLOPs/s, More Is Better
2
SE +/- 0.03, N = 3
16.5
1
SE +/- 0.00, N = 3
16.5
3
SE +/- 0.03, N = 3
16.4
4
8
12
16
20
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: OpenCL BLAS - dGEMM-TN
GFLOPs/s, More Is Better
3
SE +/- 0.03, N = 3
15.8
2
SE +/- 0.03, N = 3
15.8
1
SE +/- 0.03, N = 3
15.8
4
8
12
16
20
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

## ViennaCL 1.7.1

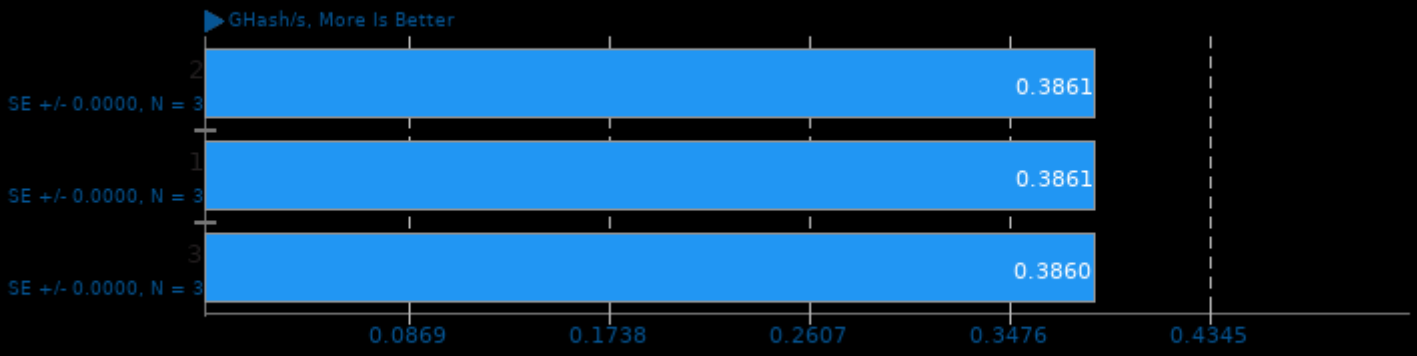
Test: OpenCL BLAS - dGEMM-TT




1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

## SHOC Scalable HeterOgeneous Computing 2020-04-17

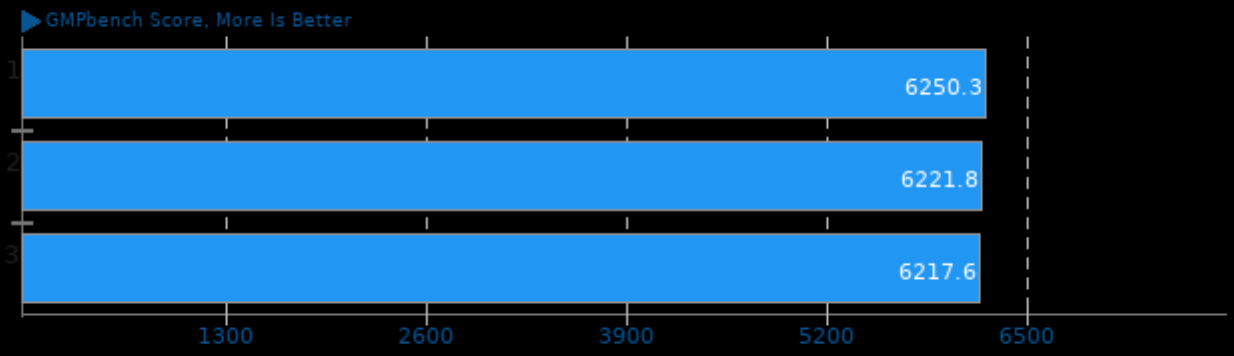
Target: OpenCL - Benchmark: MD5 Hash



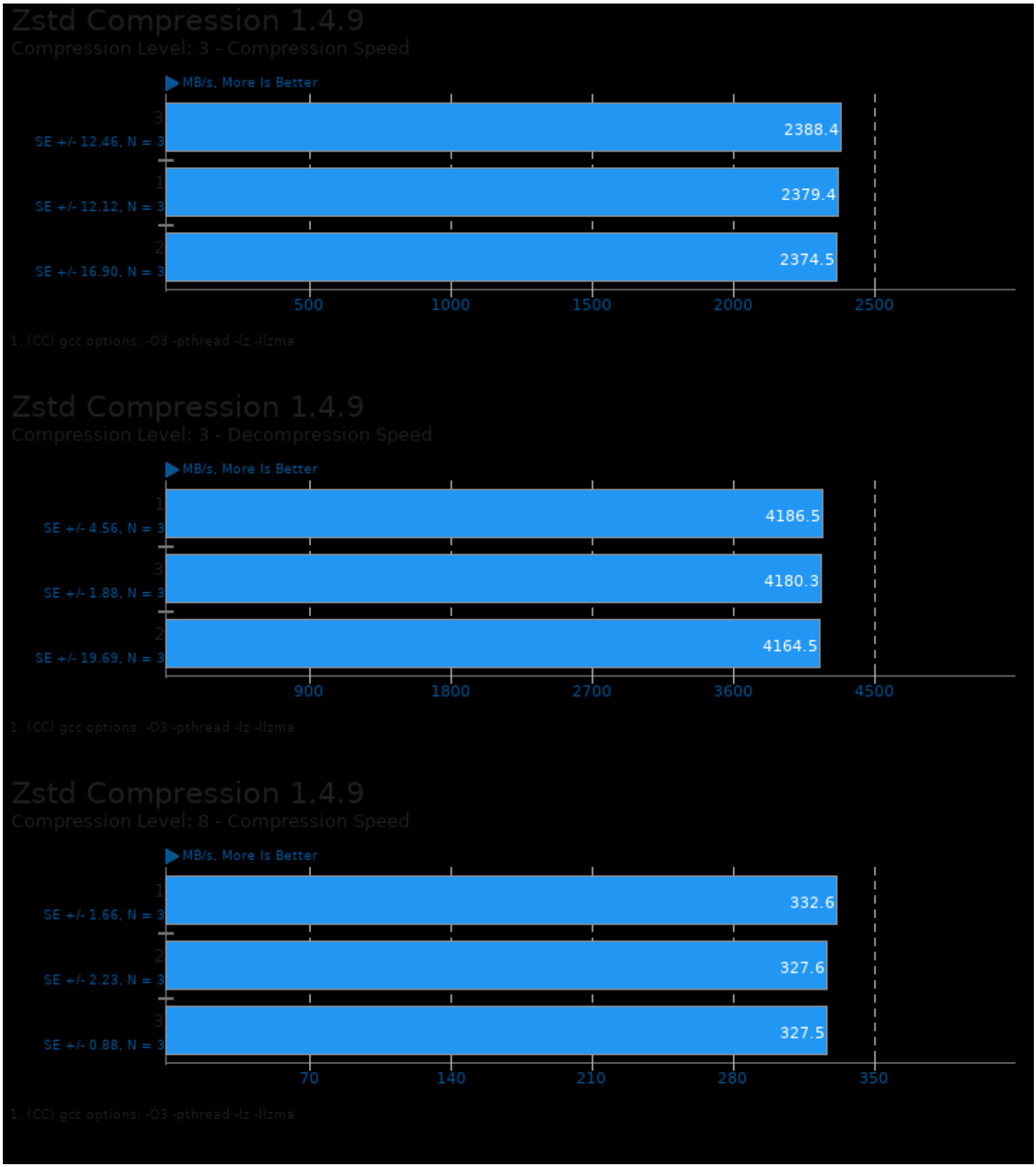

1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi

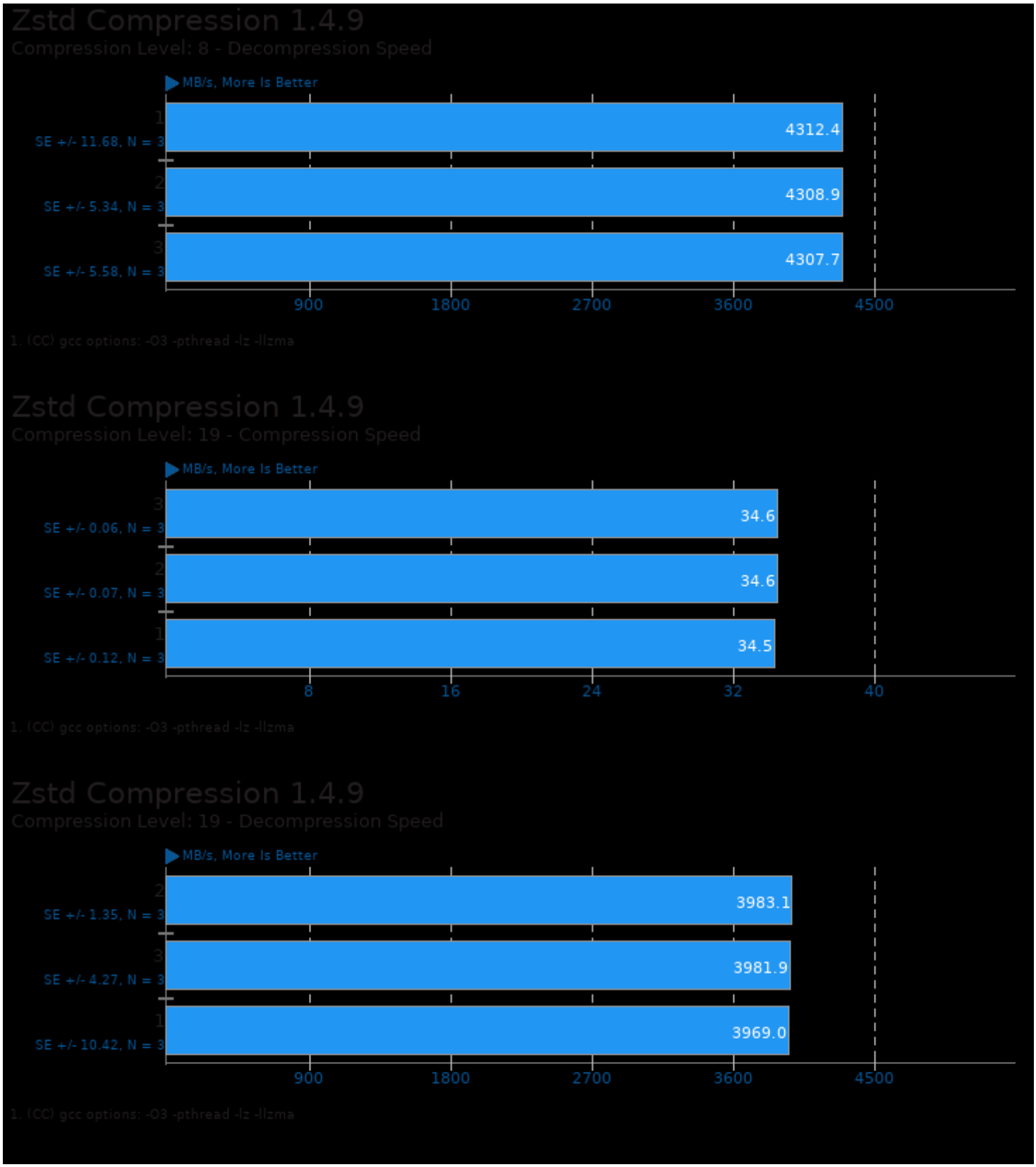
## GNU GMP GMPbench 6.2.1

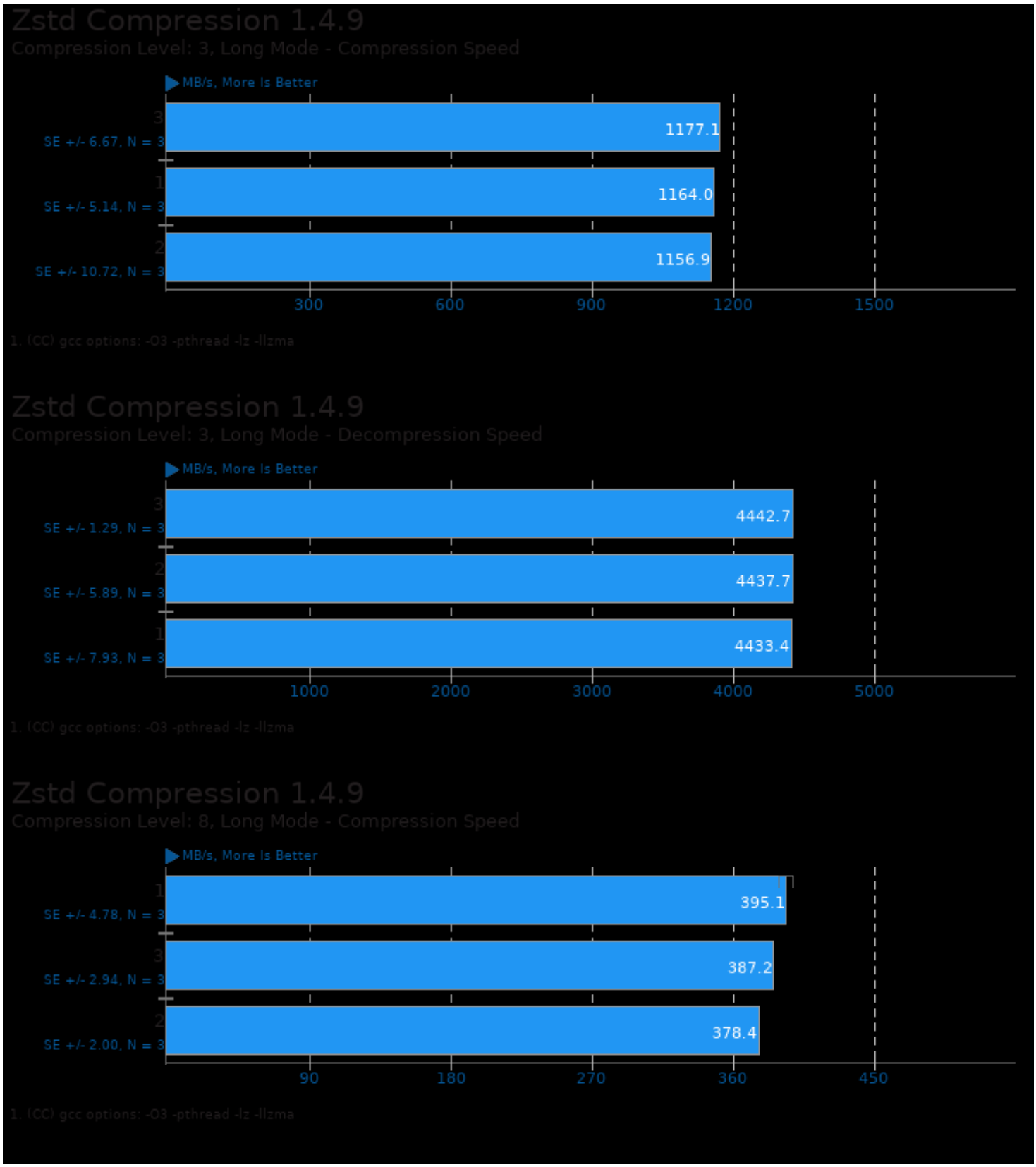
Total Time

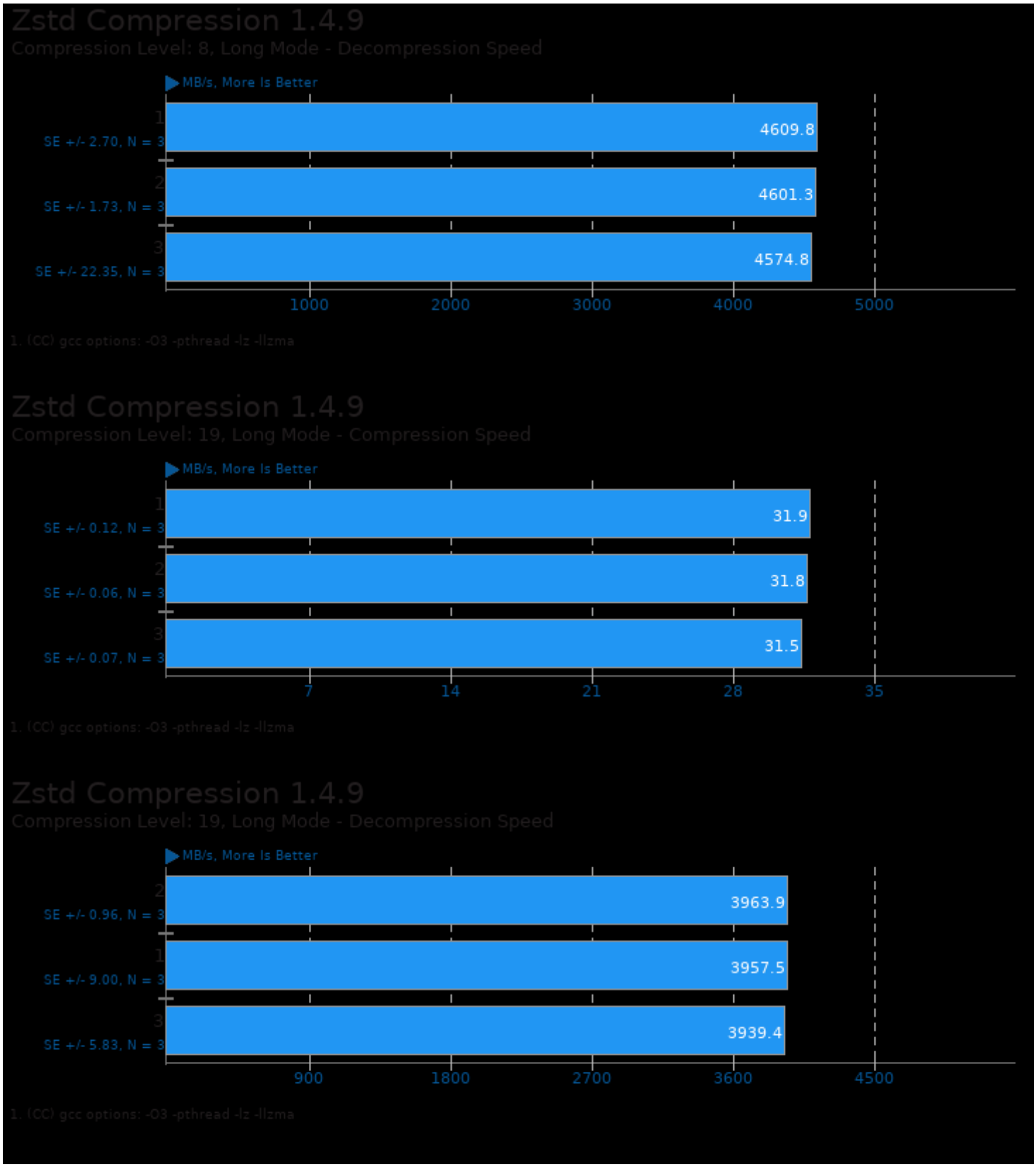



1. (CC) gcc options: -O3 -fomit-frame-pointer -lm

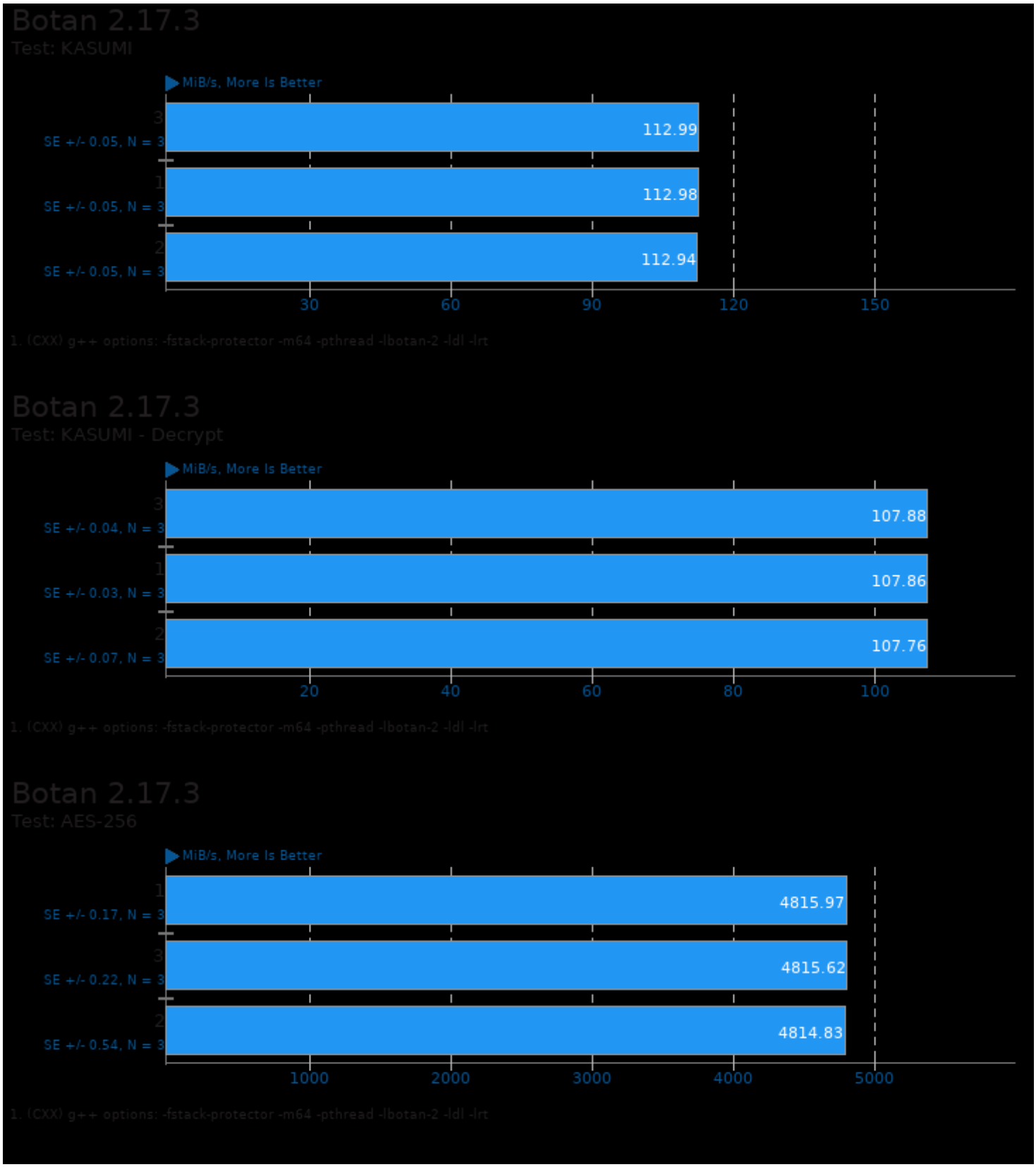

Zstd Compression 1.4.9
Compression Level: 3 - Compression Speed
MB/s, More Is Better
3
SE +/- 12.46, N = 3
2388.4
1
SE +/- 12.12, N = 3
2379.4
2
SE +/- 16.90, N = 3
2374.5
500
1000
1500
2000
2500
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 3 - Decompression Speed
MB/s, More Is Better
1
SE +/- 4.56, N = 3
4186.5
3
SE +/- 1.88, N = 3
4180.3
2
SE +/- 19.69, N = 3
4164.5
900
1800
2700
3600
4500
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 8 - Compression Speed
MB/s, More Is Better
1
SE +/- 1.66, N = 3
332.6
2
SE +/- 2.23, N = 3
327.6
3
SE +/- 0.88, N = 3
327.5
70
140
210
280
350
1. (CC) gcc options: -O3 -pthread -lz -llzma

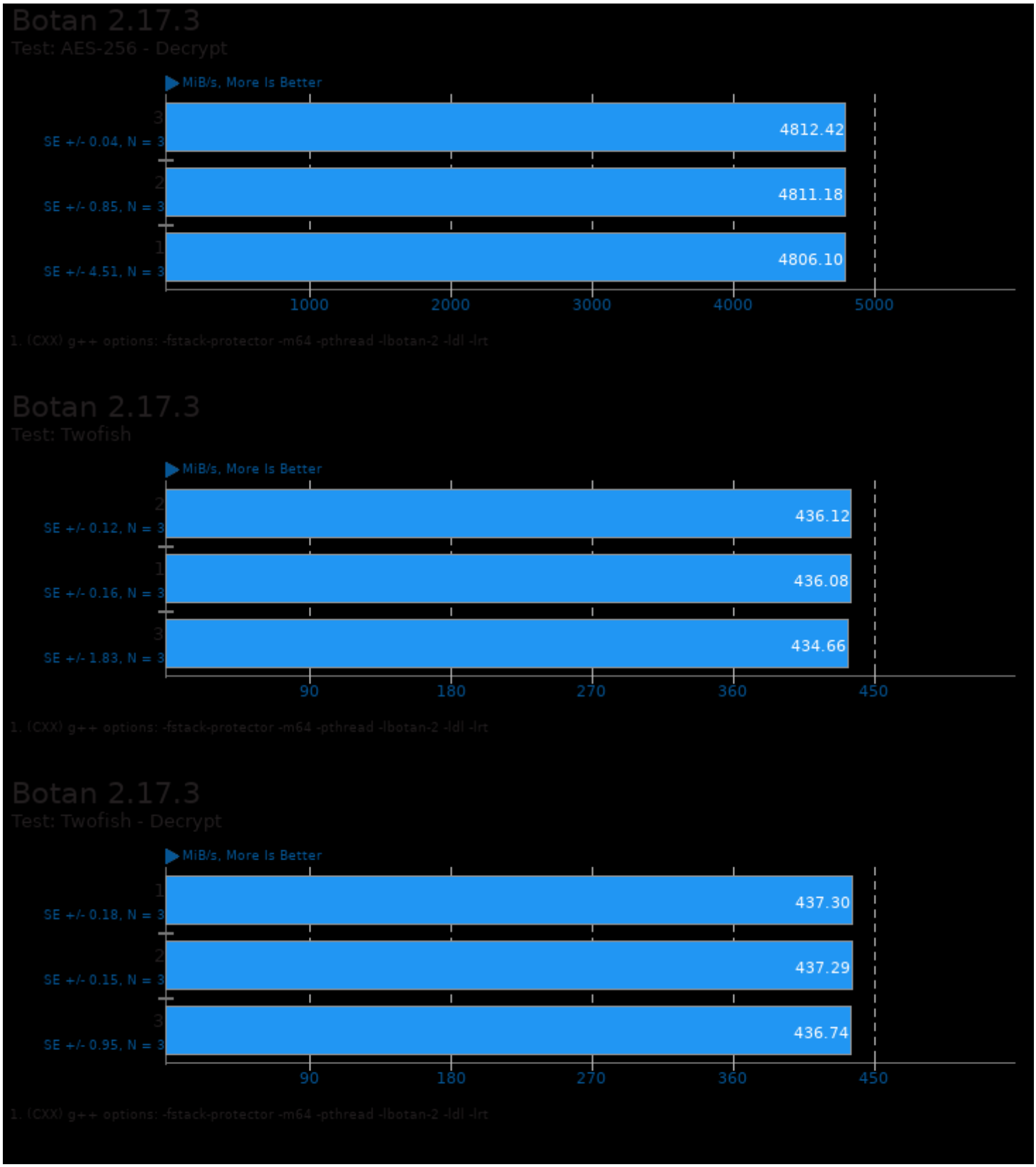

Zstd Compression 1.4.9
Compression Level: 8 - Decompression Speed
MB/s, More Is Better
1
SE +/- 11.68, N = 3
4312.4
2
SE +/- 5.34, N = 3
4308.9
3
SE +/- 5.58, N = 3
4307.7
900
1800
2700
3600
4500
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 19 - Compression Speed
MB/s, More Is Better
3
SE +/- 0.06, N = 3
34.6
2
SE +/- 0.07, N = 3
34.6
1
SE +/- 0.12, N = 3
34.5
8
16
24
32
40
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 19 - Decompression Speed
MB/s, More Is Better
2
SE +/- 1.35, N = 3
3983.1
3
SE +/- 4.27, N = 3
3981.9
1
SE +/- 10.42, N = 3
3969.0
900
1800
2700
3600
4500
1. (CC) gcc options: -O3 -pthread -lz -llzma

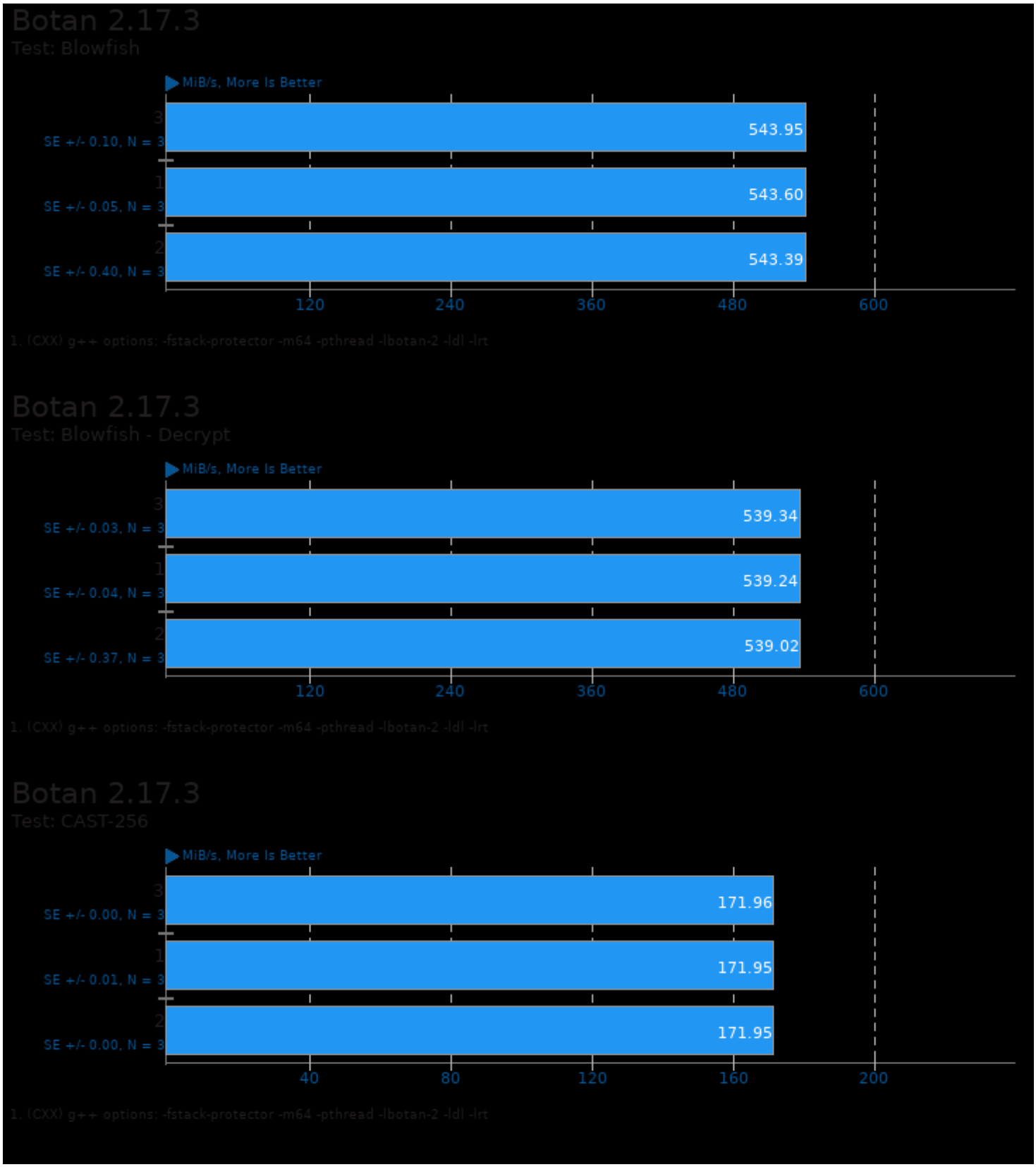

Zstd Compression 1.4.9
Compression Level: 3, Long Mode - Compression Speed
MB/s, More Is Better
3
SE +/- 6.67, N = 3
1177.1
1
SE +/- 5.14, N = 3
1164.0
2
SE +/- 10.72, N = 3
1156.9
300
600
900
1200
1500
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 3, Long Mode - Decompression Speed
MB/s, More Is Better
3
SE +/- 1.29, N = 3
4442.7
2
SE +/- 5.89, N = 3
4437.7
1
SE +/- 7.93, N = 3
4433.4
1000
2000
3000
4000
5000
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 8, Long Mode - Compression Speed
MB/s, More Is Better
1
SE +/- 4.78, N = 3
395.1
3
SE +/- 2.94, N = 3
387.2
2
SE +/- 2.00, N = 3
378.4
90
180
270
360
450
1. (CC) gcc options: -O3 -pthread -lz -llzma

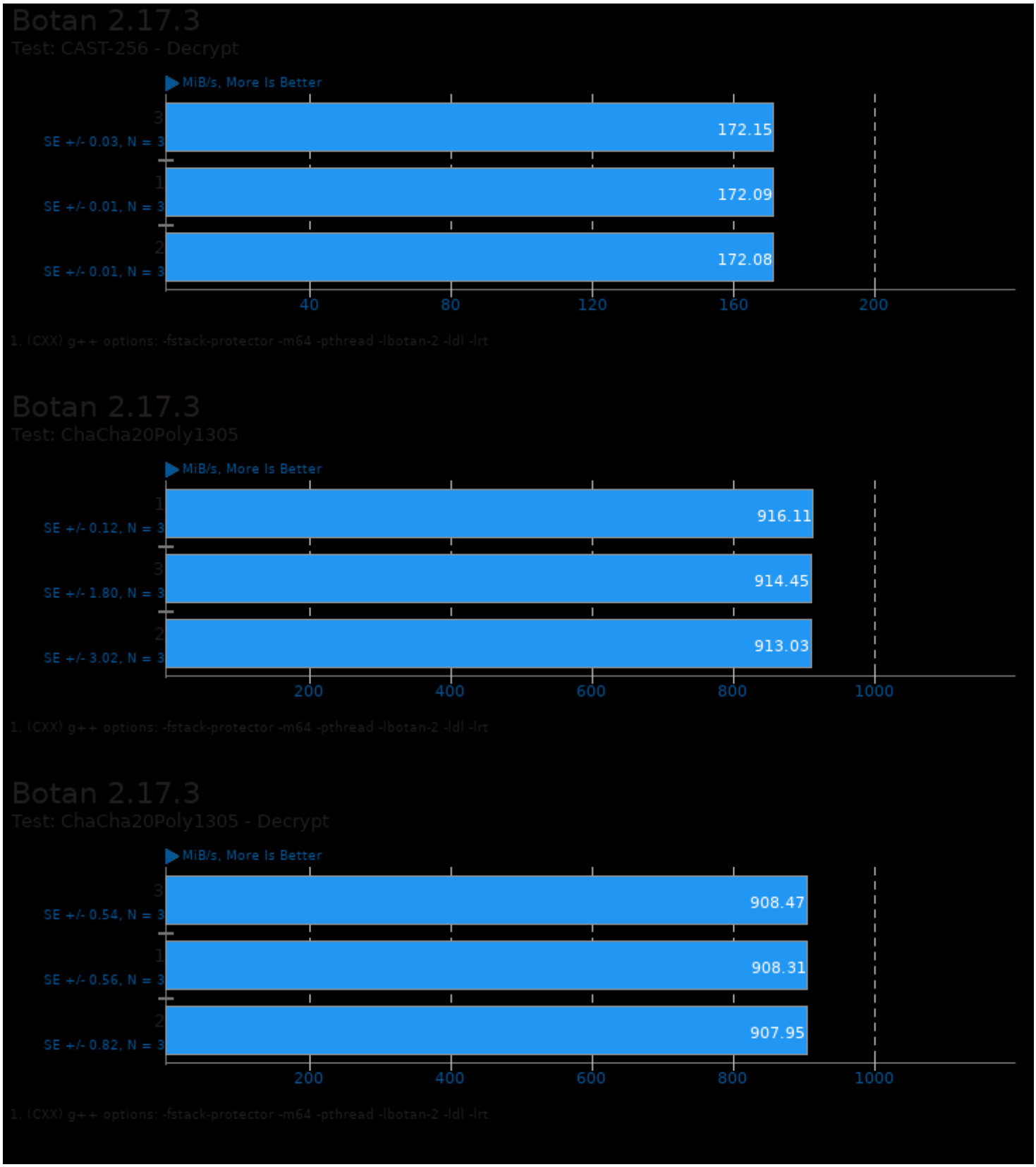

Zstd Compression 1.4.9
Compression Level: 8, Long Mode - Decompression Speed
MB/s, More Is Better
1
SE +/- 2.70, N = 3
4609.8
2
SE +/- 1.73, N = 3
4601.3
3
SE +/- 22.35, N = 3
4574.8
1000
2000
3000
4000
5000
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 19, Long Mode - Compression Speed
MB/s, More Is Better
1
SE +/- 0.12, N = 3
31.9
2
SE +/- 0.06, N = 3
31.8
3
SE +/- 0.07, N = 3
31.5
7
14
21
28
35
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 19, Long Mode - Decompression Speed
MB/s, More Is Better
2
SE +/- 0.96, N = 3
3963.9
1
SE +/- 9.00, N = 3
3957.5
3
SE +/- 5.83, N = 3
3939.4
900
1800
2700
3600
4500
1. (CC) gcc options: -O3 -pthread -lz -llzma

# 990KS March

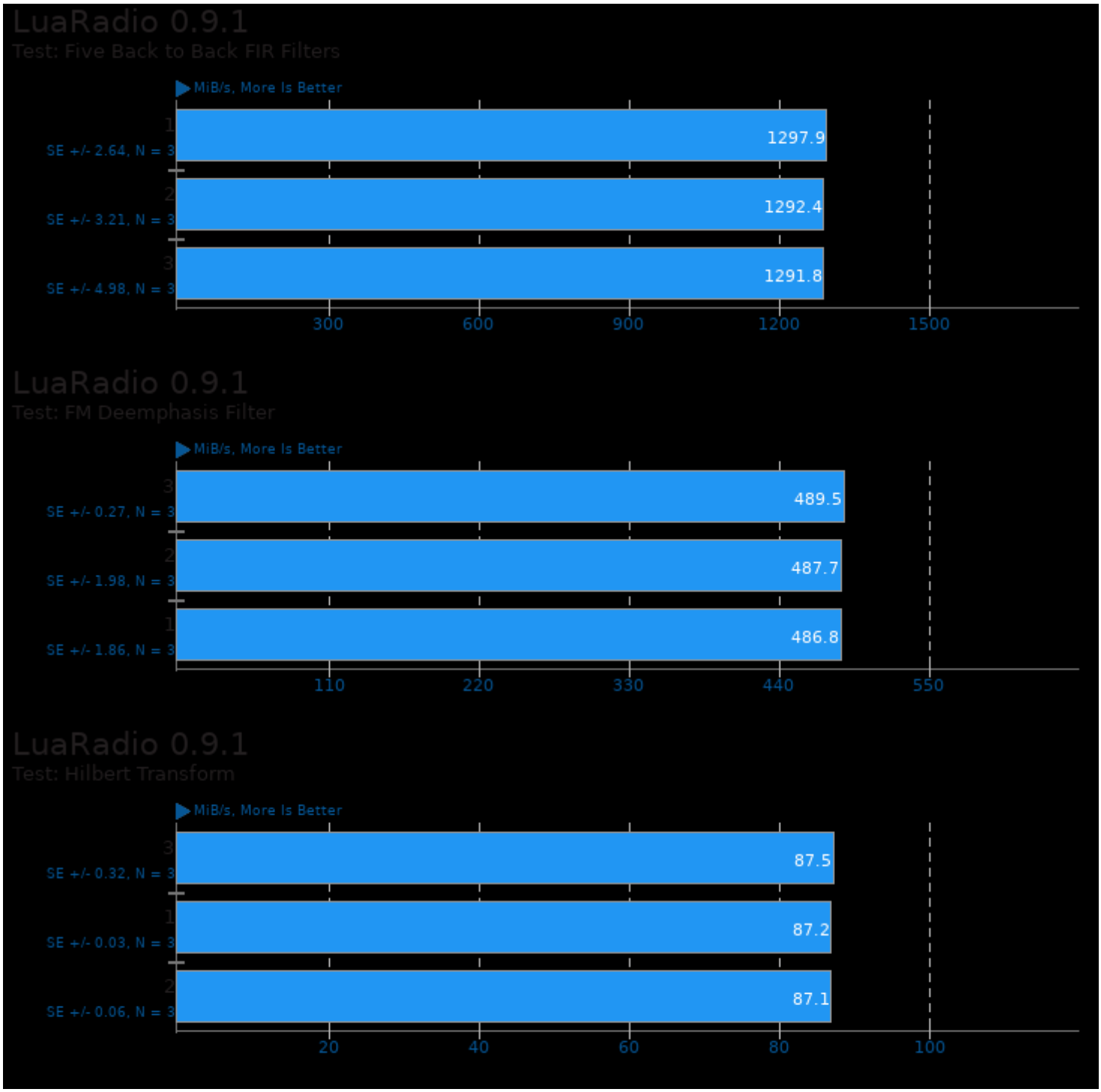

Botan 2.17.3
Test: KASUMI
MiB/s, More Is Better
3
SE +/- 0.05, N = 3
112.99
1
SE +/- 0.05, N = 3
112.98
2
SE +/- 0.05, N = 3
112.94
30
60
90
120
150
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: KASUMI - Decrypt
MiB/s, More Is Better
3
SE +/- 0.04, N = 3
107.88
1
SE +/- 0.03, N = 3
107.86
2
SE +/- 0.07, N = 3
107.76
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: AES-256
MiB/s, More Is Better
1
SE +/- 0.17, N = 3
4815.97
3
SE +/- 0.22, N = 3
4815.62
2
SE +/- 0.54, N = 3
4814.83
1000
2000
3000
4000
5000
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt


Botan 2.17.3
Test: AES-256 - Decrypt
MiB/s, More Is Better
3
SE +/- 0.04, N = 3
4812.42
2
SE +/- 0.85, N = 3
4811.18
1
SE +/- 4.51, N = 3
4806.10
1000
2000
3000
4000
5000
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Twofish
MiB/s, More Is Better
2
SE +/- 0.12, N = 3
436.12
1
SE +/- 0.16, N = 3
436.08
3
SE +/- 1.83, N = 3
434.66
90
180
270
360
450
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Twofish - Decrypt
MiB/s, More Is Better
1
SE +/- 0.18, N = 3
437.30
2
SE +/- 0.15, N = 3
437.29
3
SE +/- 0.95, N = 3
436.74
90
180
270
360
450
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

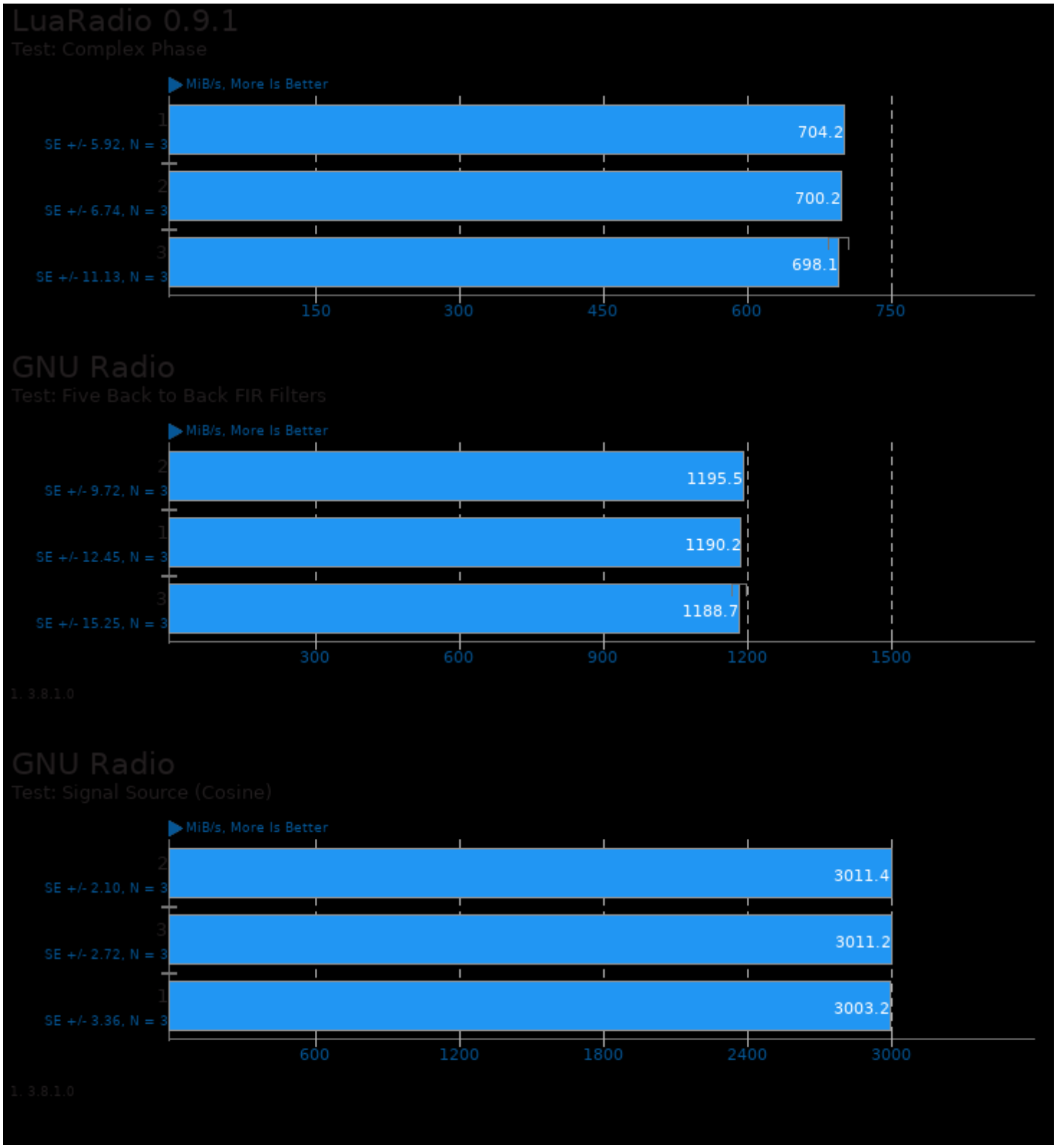

Botan 2.17.3
Test: Blowfish
MiB/s, More Is Better
543.95
543.60
543.39
SE +/- 0.10, N = 3
SE +/- 0.05, N = 3
SE +/- 0.40, N = 3
120
240
360
480
600
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Blowfish - Decrypt
MiB/s, More Is Better
539.34
539.24
539.02
SE +/- 0.03, N = 3
SE +/- 0.04, N = 3
SE +/- 0.37, N = 3
120
240
360
480
600
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: CAST-256
MiB/s, More Is Better
171.96
171.95
171.95
SE +/- 0.00, N = 3
SE +/- 0.01, N = 3
SE +/- 0.00, N = 3
40
80
120
160
200
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt


Botan 2.17.3
Test: CAST-256 - Decrypt
MiB/s, More Is Better
3
SE +/- 0.03, N = 3
172.15
1
SE +/- 0.01, N = 3
172.09
2
SE +/- 0.01, N = 3
172.08
40
80
120
160
200
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: ChaCha20Poly1305
MiB/s, More Is Better
1
SE +/- 0.12, N = 3
916.11
3
SE +/- 1.80, N = 3
914.45
2
SE +/- 3.02, N = 3
913.03
200
400
600
800
1000
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: ChaCha20Poly1305 - Decrypt
MiB/s, More Is Better
3
SE +/- 0.54, N = 3
908.47
1
SE +/- 0.56, N = 3
908.31
2
SE +/- 0.82, N = 3
907.95
200
400
600
800
1000
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

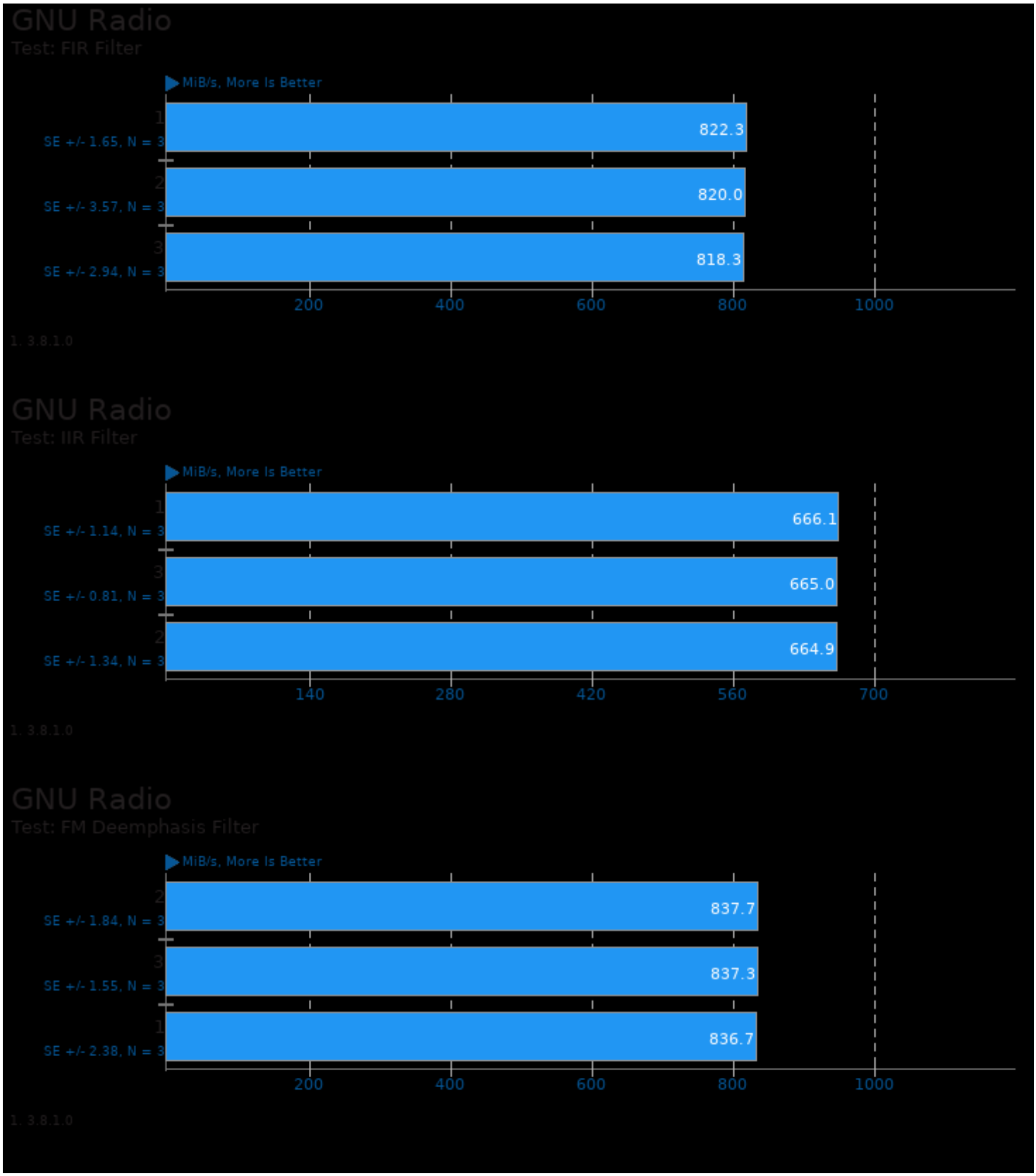
# 990KS March


LuaRadio 0.9.1
Test: Five Back to Back FIR Filters
MiB/s, More Is Better
1
SE +/- 2.64, N = 3
1297.9
2
SE +/- 3.21, N = 3
1292.4
3
SE +/- 4.98, N = 3
1291.8
300
600
900
1200
1500
LuaRadio 0.9.1
Test: FM Deemphasis Filter
MiB/s, More Is Better
3
SE +/- 0.27, N = 3
489.5
2
SE +/- 1.98, N = 3
487.7
1
SE +/- 1.86, N = 3
486.8
110
220
330
440
550
LuaRadio 0.9.1
Test: Hilbert Transform
MiB/s, More Is Better
3
SE +/- 0.32, N = 3
87.5
1
SE +/- 0.03, N = 3
87.2
2
SE +/- 0.06, N = 3
87.1
20
40
60
80
100

# 990KS March


LuaRadio 0.9.1
Test: Complex Phase
MiB/s, More Is Better
1
SE +/- 5.92, N = 3
704.2
2
SE +/- 6.74, N = 3
700.2
3
SE +/- 11.13, N = 3
698.1
150
300
450
600
750
GNU Radio
Test: Five Back to Back FIR Filters
MiB/s, More Is Better
2
SE +/- 9.72, N = 3
1195.5
1
SE +/- 12.45, N = 3
1190.2
3
SE +/- 15.25, N = 3
1188.7
300
600
900
1200
1500
1. 3.8.1.0
GNU Radio
Test: Signal Source (Cosine)
MiB/s, More Is Better
2
SE +/- 2.10, N = 3
3011.4
3
SE +/- 2.72, N = 3
3011.2
1
SE +/- 3.36, N = 3
3003.2
600
1200
1800
2400
3000
1. 3.8.1.0

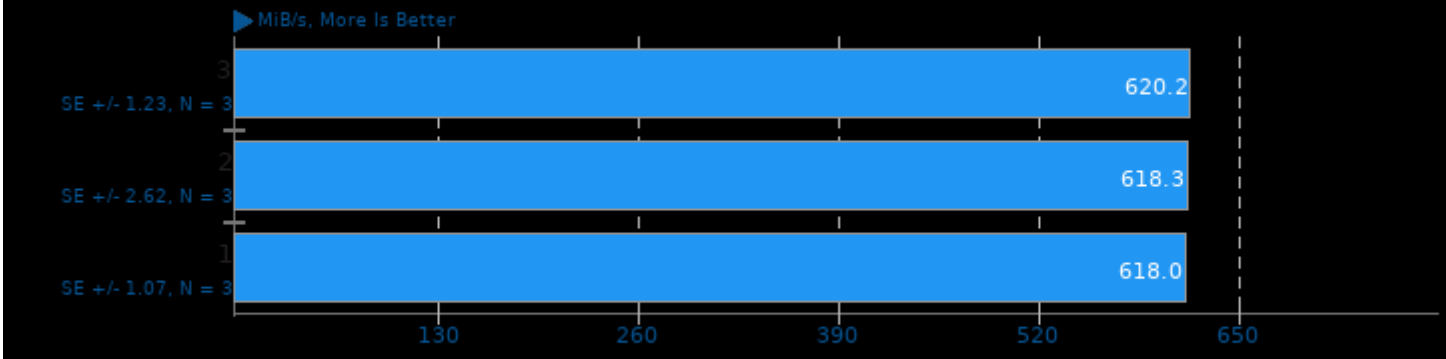
# 990KS March


GNU Radio
Test: FIR Filter
MiB/s, More Is Better
1
SE +/- 1.65, N = 3
822.3
2
SE +/- 3.57, N = 3
820.0
3
SE +/- 2.94, N = 3
818.3
200
400
600
800
1000
1. 3.8.1.0
GNU Radio
Test: IIR Filter
MiB/s, More Is Better
1
SE +/- 1.14, N = 3
666.1
3
SE +/- 0.81, N = 3
665.0
2
SE +/- 1.34, N = 3
664.9
140
280
420
560
700
1. 3.8.1.0
GNU Radio
Test: FM Deemphasis Filter
MiB/s, More Is Better
2
SE +/- 1.84, N = 3
837.7
3
SE +/- 1.55, N = 3
837.3
1
SE +/- 2.38, N = 3
836.7
200
400
600
800
1000
1. 3.8.1.0

# 990KS March

## GNU Radio

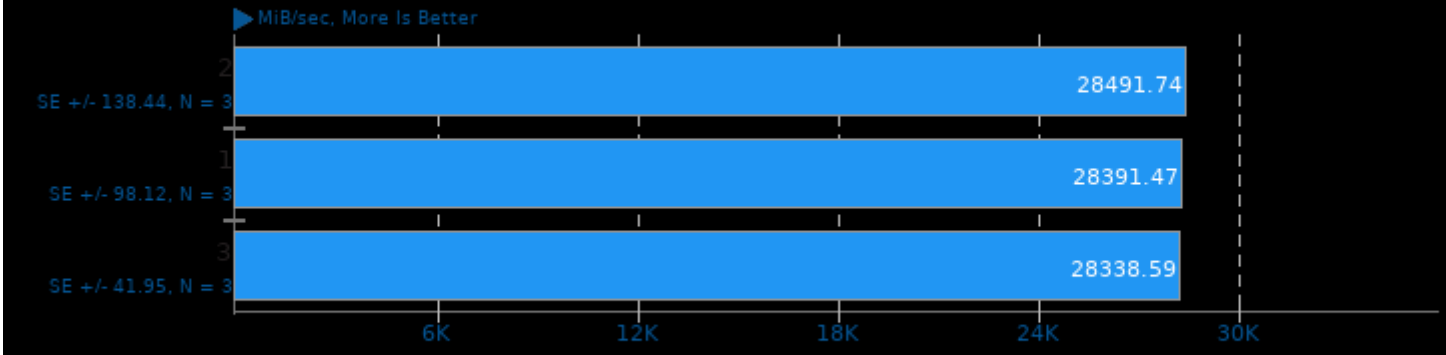
Test: Hilbert Transform




1. 3.8.1.0

## Sysbench 1.0.20

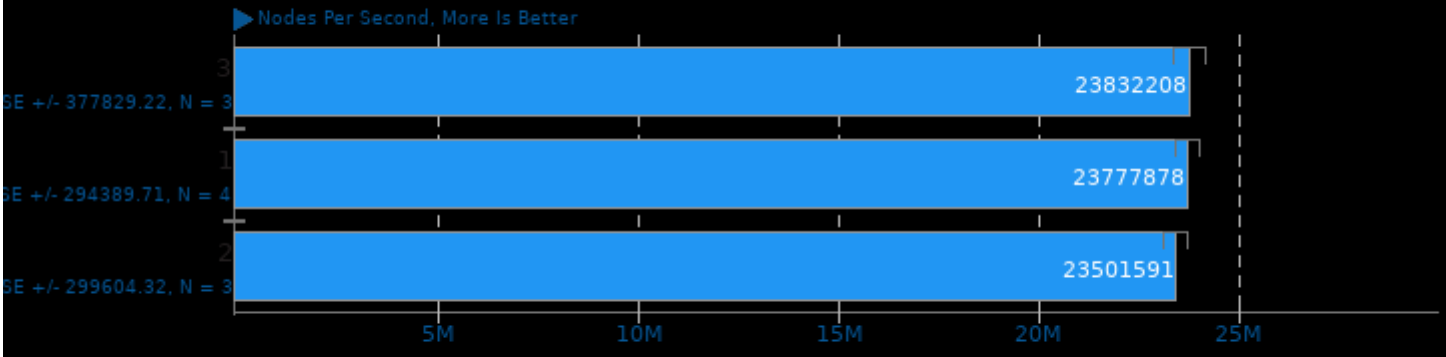
Test: RAM / Memory




1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm

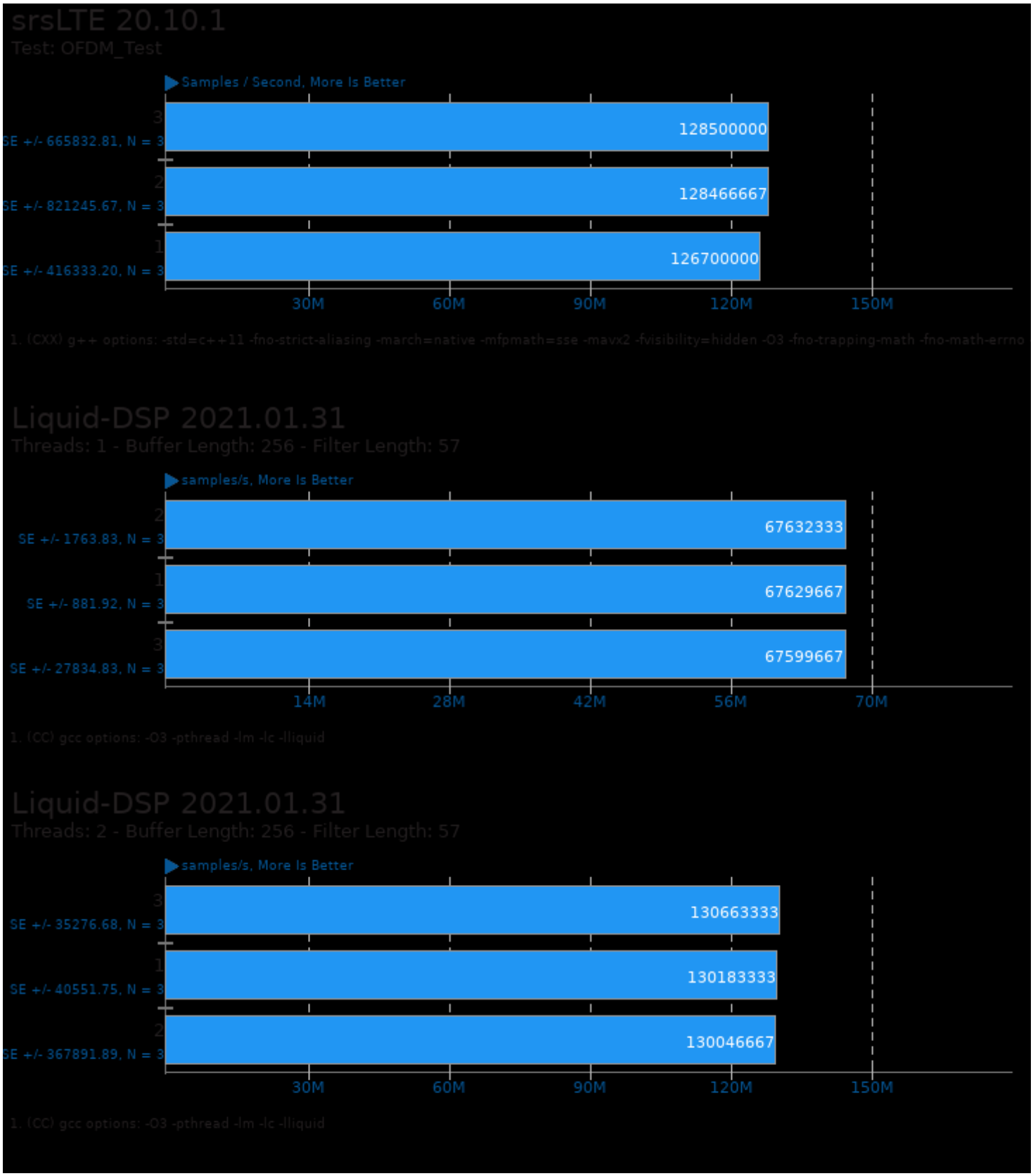
## Stockfish 13

Total Time

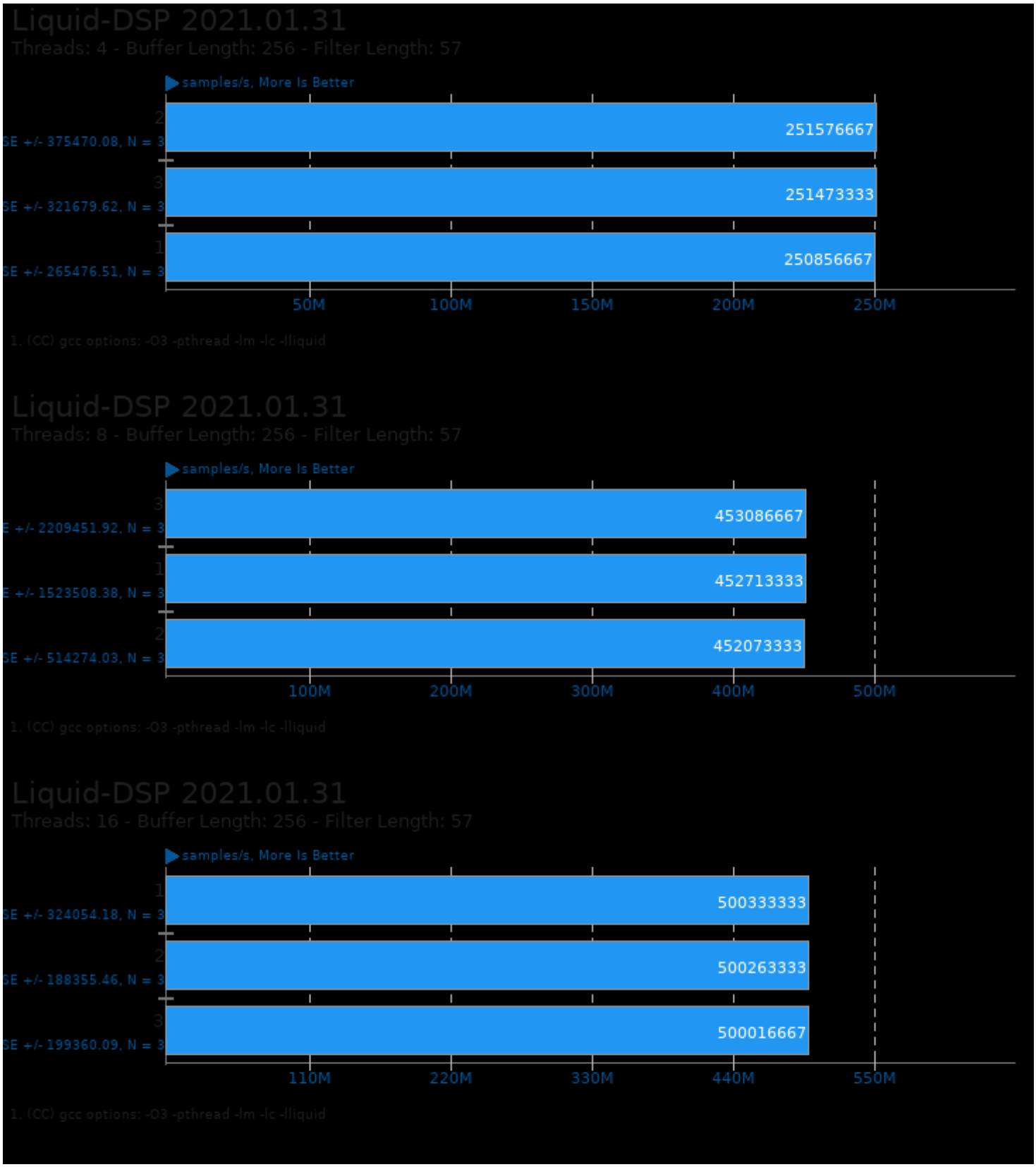



1. (CXX) g++ options: -lgcov -m64 -lpthread -fno-exceptions -std=c++17 -fprofile-use -fno-peel-loops -fno-tracer -pedantic -O3 -msse -msse3 -mpopcnt -

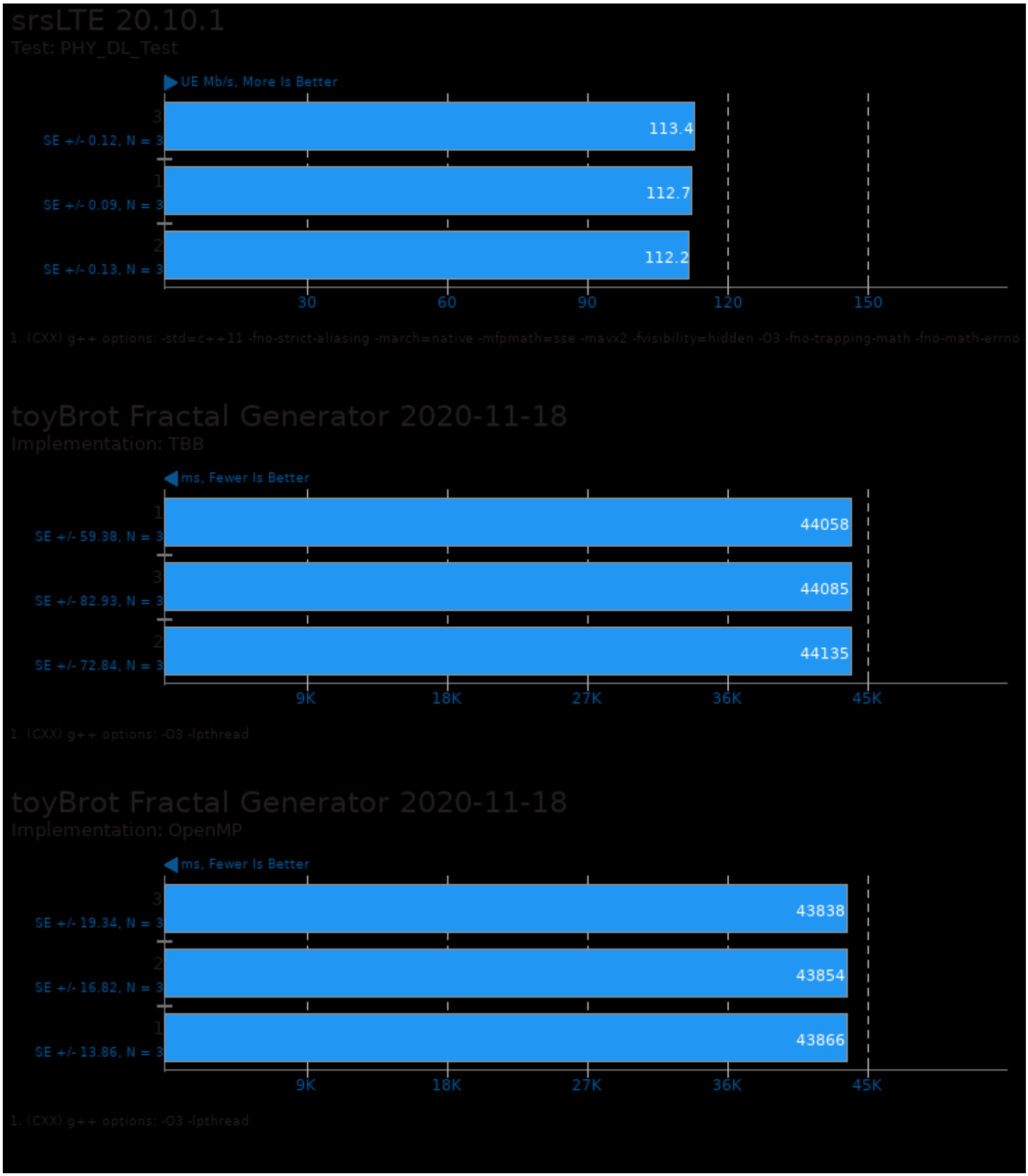
# 990KS March


srsLTE 20.10.1
Test: OFDM_Test
Samples / Second, More Is Better
3
SE +/- 665832.81, N = 3
128500000
2
SE +/- 821245.67, N = 3
128466667
1
SE +/- 416333.20, N = 3
126700000
30M
60M
90M
120M
150M
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
Liquid-DSP 2021.01.31
Threads: 1 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
2
SE +/- 1763.83, N = 3
67632333
1
SE +/- 881.92, N = 3
67629667
3
SE +/- 27834.83, N = 3
67599667
14M
28M
42M
56M
70M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 2 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
3
SE +/- 35276.68, N = 3
130663333
1
SE +/- 40551.75, N = 3
130183333
2
SE +/- 367891.89, N = 3
130046667
30M
60M
90M
120M
150M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

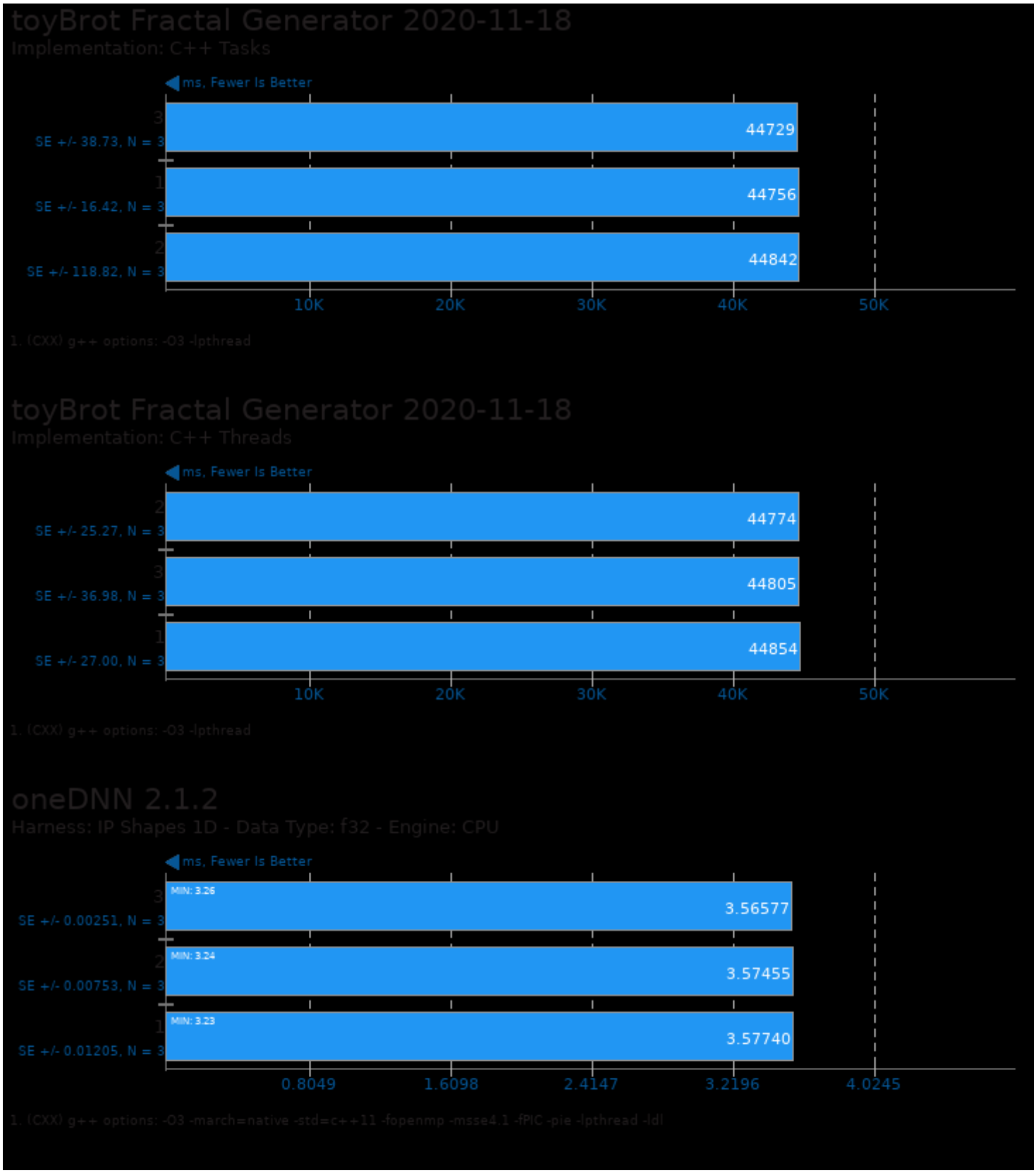
# 990KS March


Liquid-DSP 2021.01.31
Threads: 4 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
2
251576667
SE +/- 375470.08, N = 3
3
251473333
SE +/- 321679.62, N = 3
1
250856667
SE +/- 265476.51, N = 3
50M
100M
150M
200M
250M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 8 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
3
453086667
E +/- 2209451.92, N = 3
1
452713333
E +/- 1523508.38, N = 3
2
452073333
SE +/- 514274.03, N = 3
100M
200M
300M
400M
500M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 16 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
1
500333333
SE +/- 324054.18, N = 3
2
500263333
SE +/- 188355.46, N = 3
3
500016667
SE +/- 199360.09, N = 3
110M
220M
330M
440M
550M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

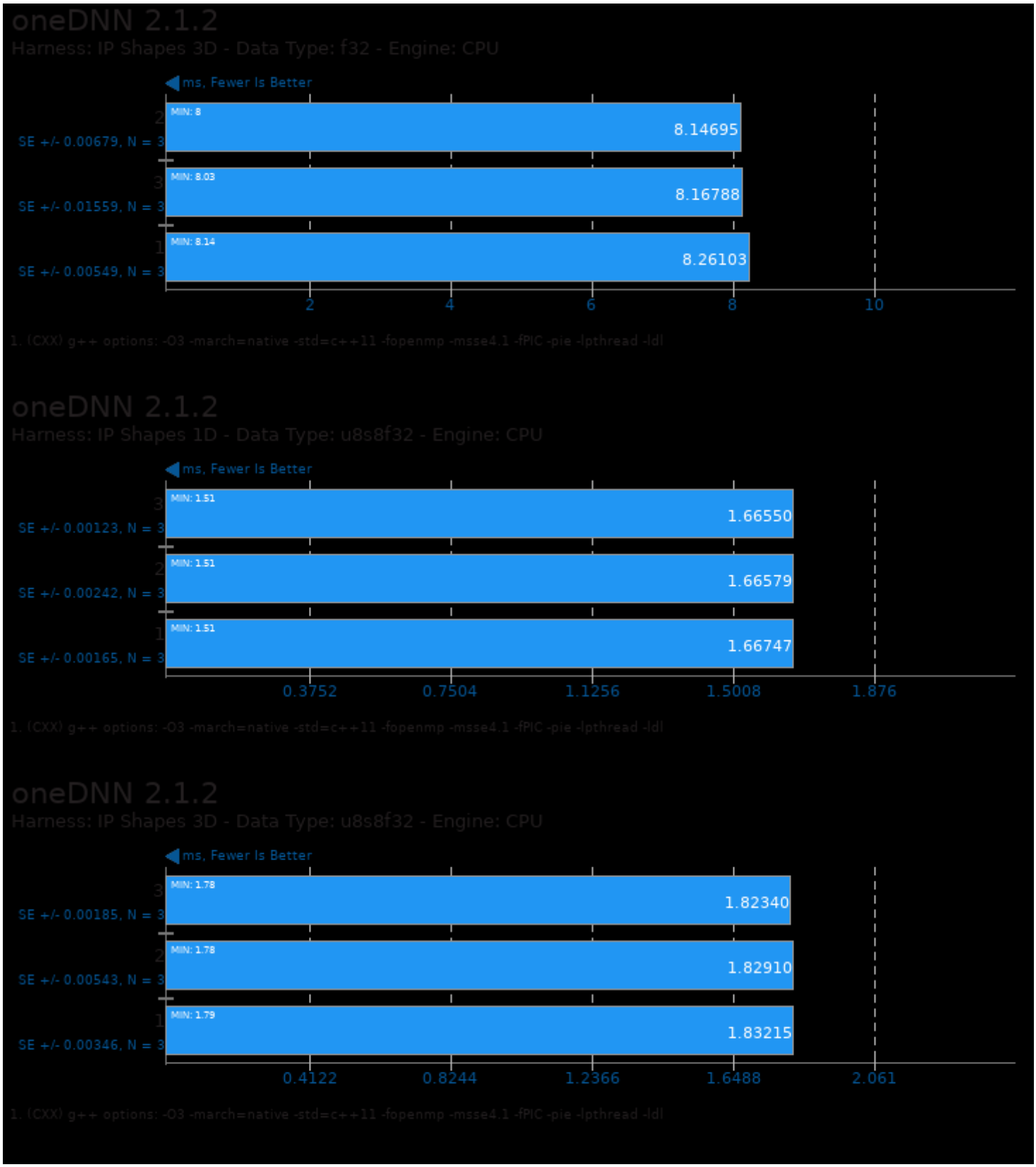
# 990KS March


srsLTE 20.10.1
Test: PHY_DL_Test
UE Mb/s, More Is Better
3
SE +/- 0.12, N = 3
113.4
1
SE +/- 0.09, N = 3
112.7
2
SE +/- 0.13, N = 3
112.2
30
60
90
120
150
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
toyBrot Fractal Generator 2020-11-18
Implementation: TBB
ms, Fewer Is Better
1
SE +/- 59.38, N = 3
44058
3
SE +/- 82.93, N = 3
44085
2
SE +/- 72.84, N = 3
44135
9K
18K
27K
36K
45K
1. (CXX) g++ options: -O3 -lpthread
toyBrot Fractal Generator 2020-11-18
Implementation: OpenMP
ms, Fewer Is Better
3
SE +/- 19.34, N = 3
43838
2
SE +/- 16.82, N = 3
43854
1
SE +/- 13.86, N = 3
43866
9K
18K
27K
36K
45K
1. (CXX) g++ options: -O3 -lpthread

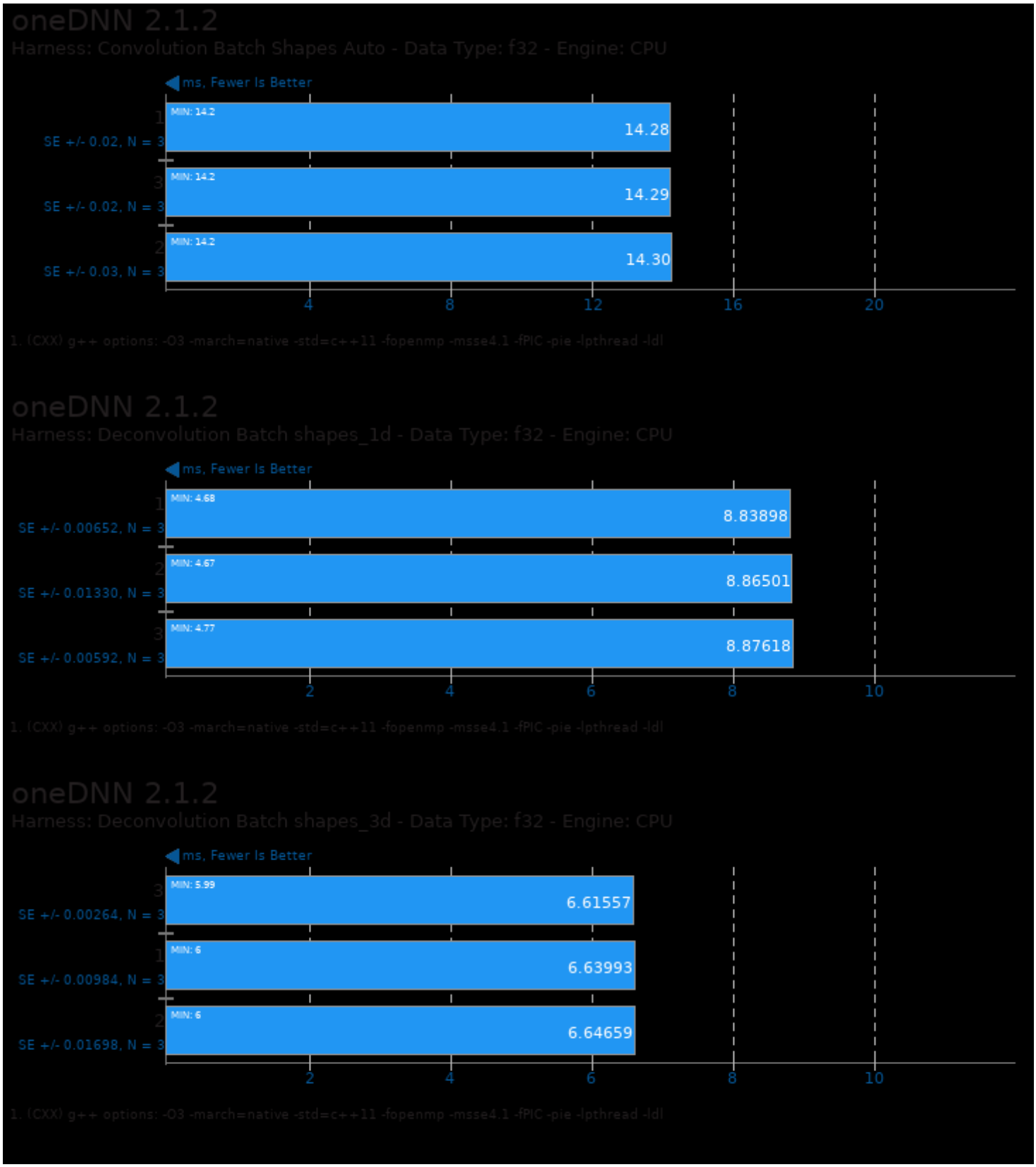
# 990KS March


toyBrot Fractal Generator 2020-11-18
Implementation: C++ Tasks
ms, Fewer Is Better
SE +/- 38.73, N = 3
44729
SE +/- 16.42, N = 3
44756
SE +/- 118.82, N = 3
44842
10K
20K
30K
40K
50K
1. (CXX) g++ options: -O3 -lpthread
toyBrot Fractal Generator 2020-11-18
Implementation: C++ Threads
ms, Fewer Is Better
SE +/- 25.27, N = 3
44774
SE +/- 36.98, N = 3
44805
SE +/- 27.00, N = 3
44854
10K
20K
30K
40K
50K
1. (CXX) g++ options: -O3 -lpthread
oneDNN 2.1.2
Harness: IP Shapes 1D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00251, N = 3
MIN: 3.26
3.56577
SE +/- 0.00753, N = 3
MIN: 3.24
3.57455
SE +/- 0.01205, N = 3
MIN: 3.23
3.57740
0.8049
1.6098
2.4147
3.2196
4.0245
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

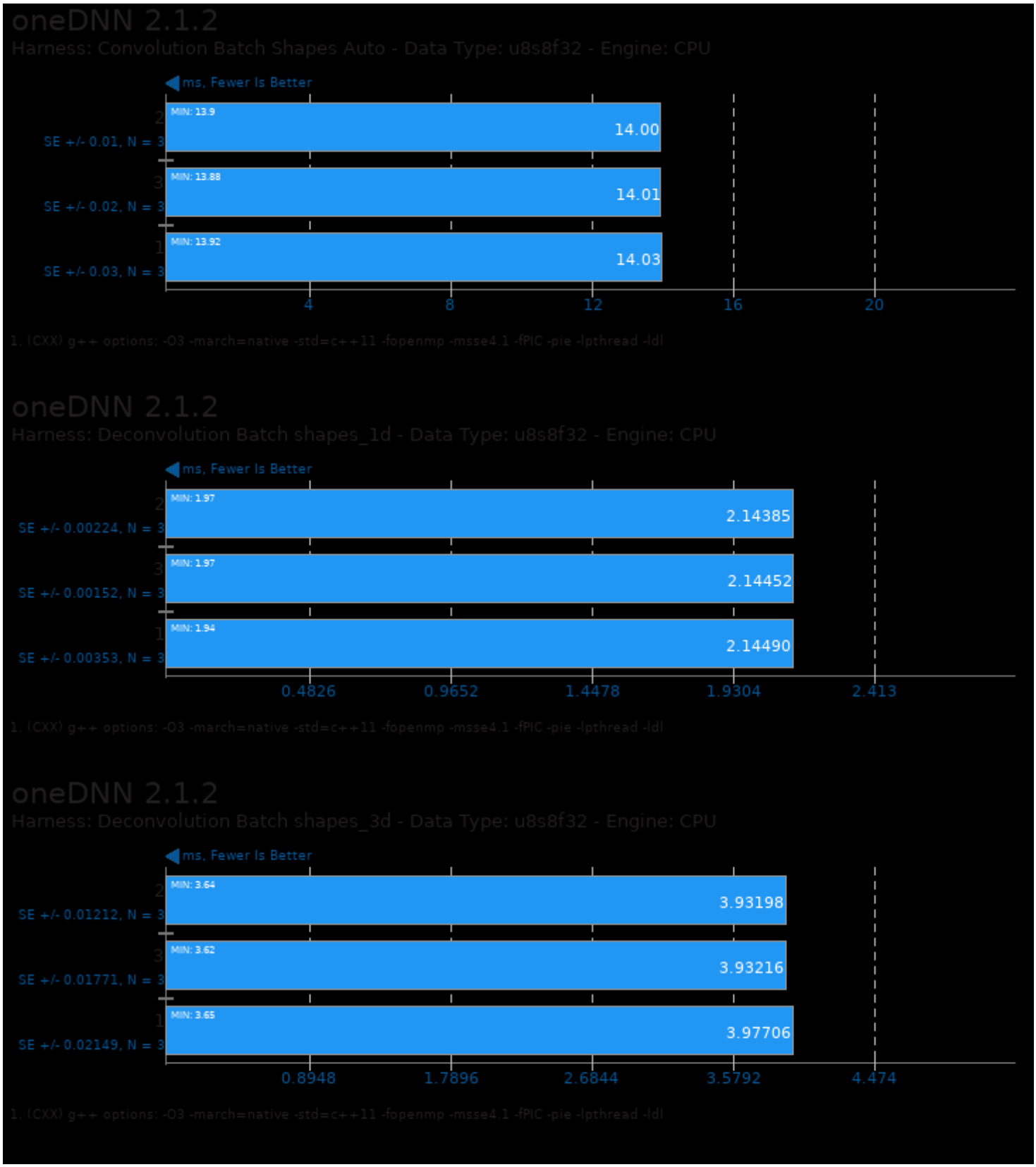
# 990KS March


oneDNN 2.1.2
Harness: IP Shapes 3D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
MIN: 8
8.14695
SE +/- 0.00679, N = 3
MIN: 8.03
8.16788
SE +/- 0.01559, N = 3
MIN: 8.14
8.26103
SE +/- 0.00549, N = 3
2
4
6
8
10
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: IP Shapes 1D - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
MIN: 1.51
1.66550
SE +/- 0.00123, N = 3
MIN: 1.51
1.66579
SE +/- 0.00242, N = 3
MIN: 1.51
1.66747
SE +/- 0.00165, N = 3
0.3752
0.7504
1.1256
1.5008
1.876
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: IP Shapes 3D - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
MIN: 1.78
1.82340
SE +/- 0.00185, N = 3
MIN: 1.78
1.82910
SE +/- 0.00543, N = 3
MIN: 1.79
1.83215
SE +/- 0.00346, N = 3
0.4122
0.8244
1.2366
1.6488
2.061
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

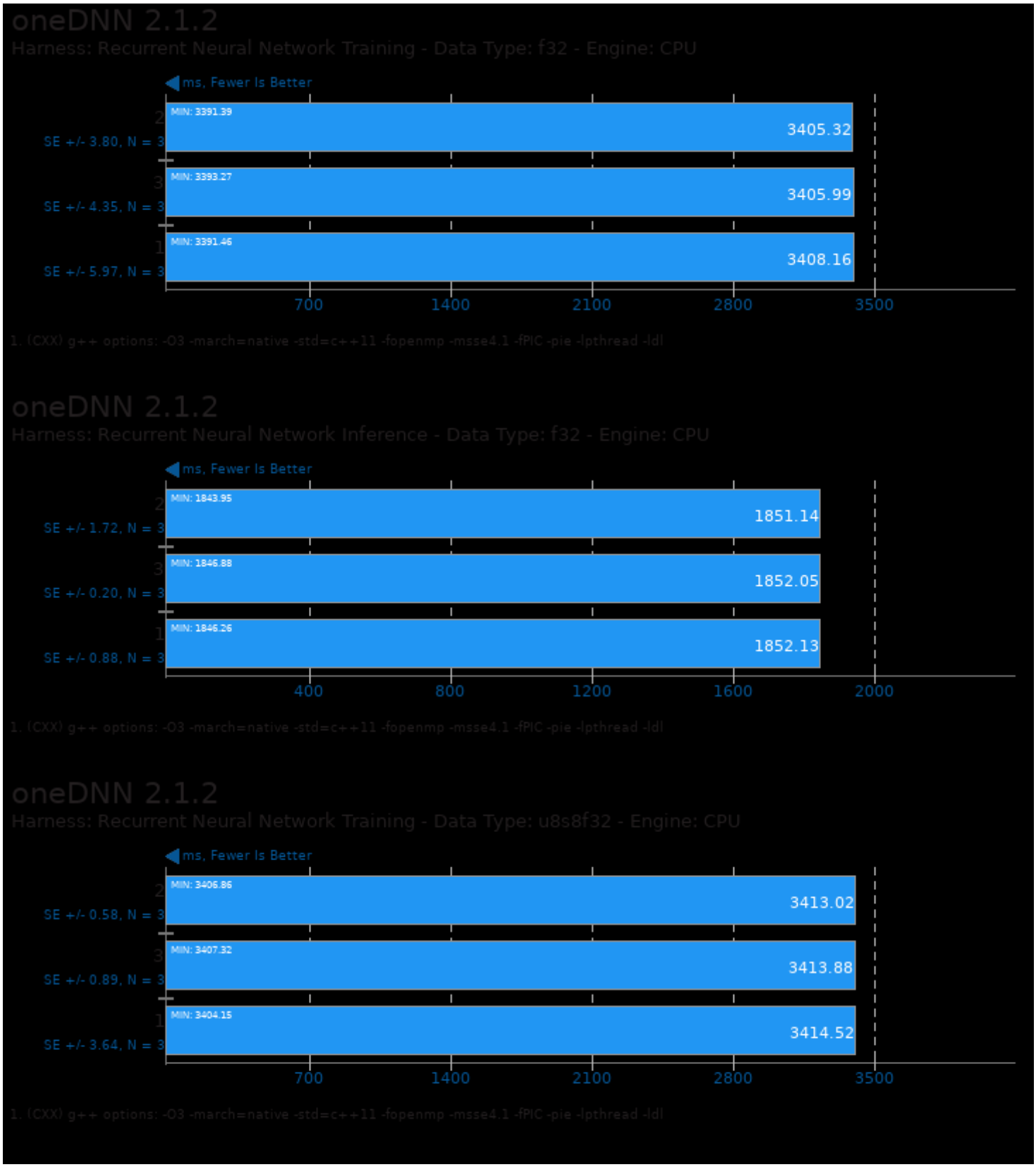
# 990KS March


oneDNN 2.1.2
Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
MIN: 14.2
14.28
SE +/- 0.02, N = 3
MIN: 14.2
14.29
SE +/- 0.02, N = 3
MIN: 14.2
14.30
SE +/- 0.03, N = 3
4
8
12
16
20
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_1d - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
MIN: 4.68
8.83898
SE +/- 0.00652, N = 3
MIN: 4.67
8.86501
SE +/- 0.01330, N = 3
MIN: 4.77
8.87618
SE +/- 0.00592, N = 3
2
4
6
8
10
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_3d - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
MIN: 5.99
6.61557
SE +/- 0.00264, N = 3
MIN: 6
6.63993
SE +/- 0.00984, N = 3
MIN: 6
6.64659
SE +/- 0.01698, N = 3
2
4
6
8
10
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

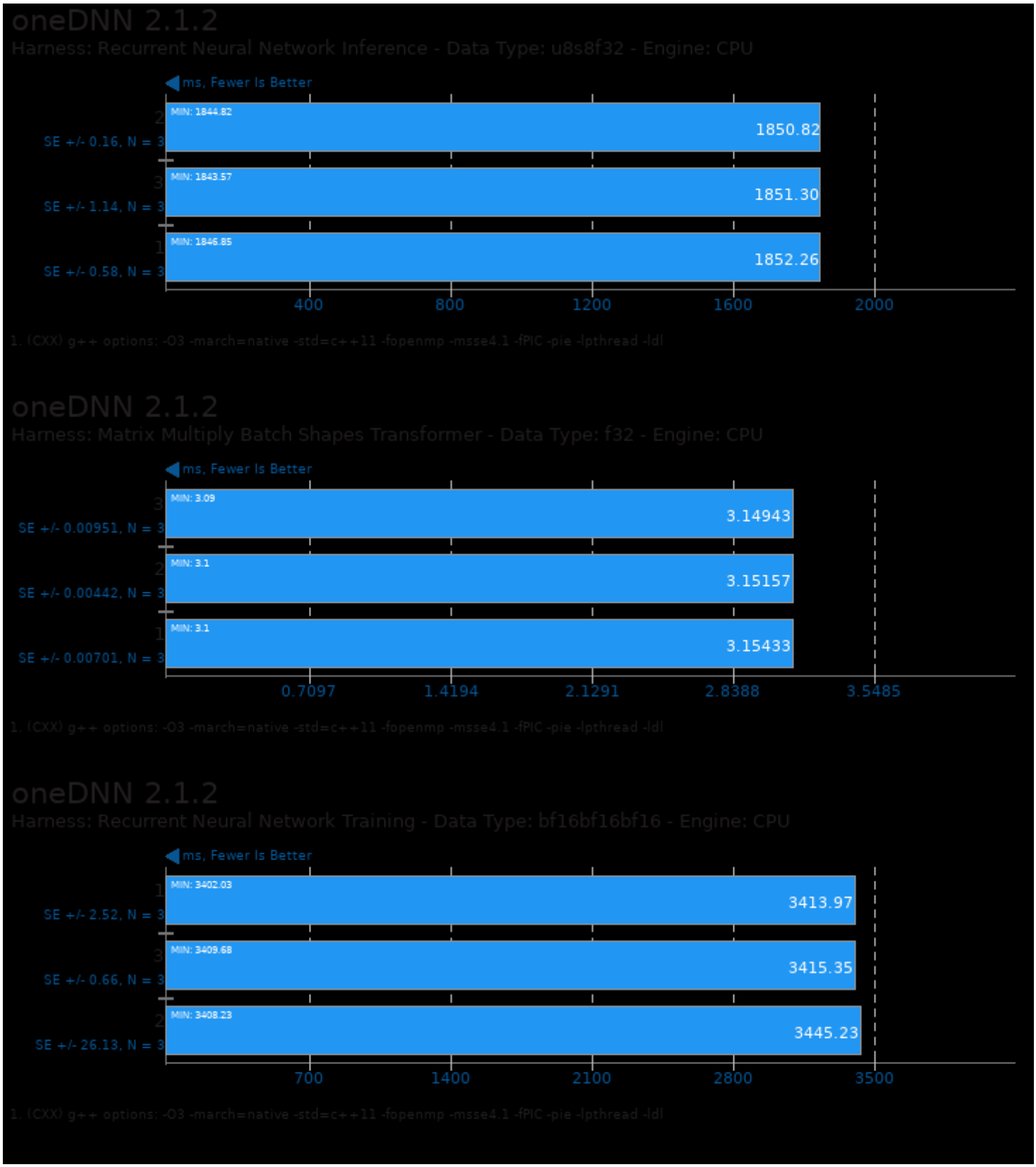
# 990KS March


oneDNN 2.1.2
Harness: Convolution Batch Shapes Auto - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
MIN: 13.9
14.00
SE +/- 0.01, N = 3
MIN: 13.88
14.01
SE +/- 0.02, N = 3
MIN: 13.92
14.03
SE +/- 0.03, N = 3
4
8
12
16
20
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_1d - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
MIN: 1.97
2.14385
SE +/- 0.00224, N = 3
MIN: 1.97
2.14452
SE +/- 0.00152, N = 3
MIN: 1.94
2.14490
SE +/- 0.00353, N = 3
0.4826
0.9652
1.4478
1.9304
2.413
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_3d - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
MIN: 3.64
3.93198
SE +/- 0.01212, N = 3
MIN: 3.62
3.93216
SE +/- 0.01771, N = 3
MIN: 3.65
3.97706
SE +/- 0.02149, N = 3
0.8948
1.7896
2.6844
3.5792
4.474
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

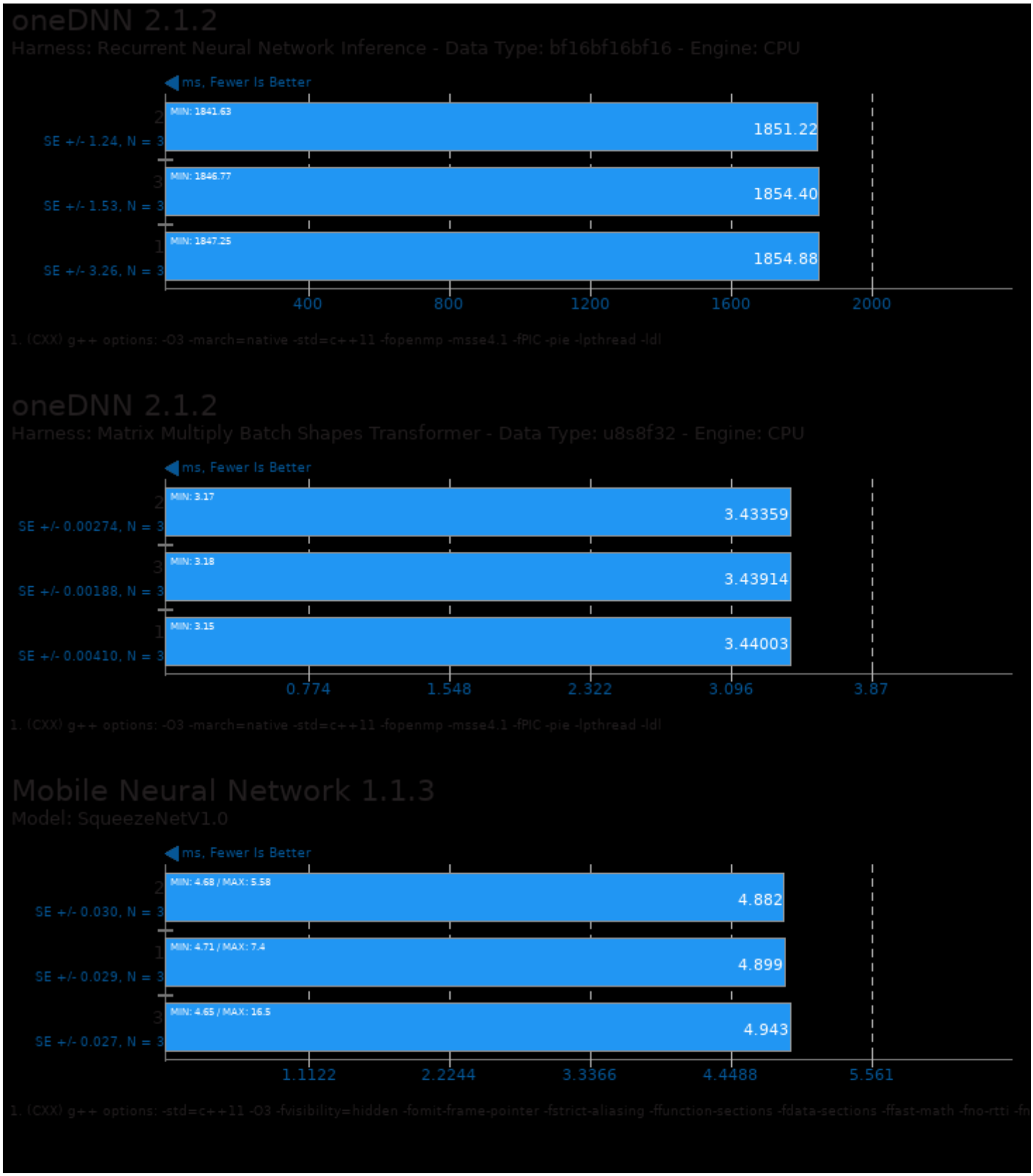
# 990KS March

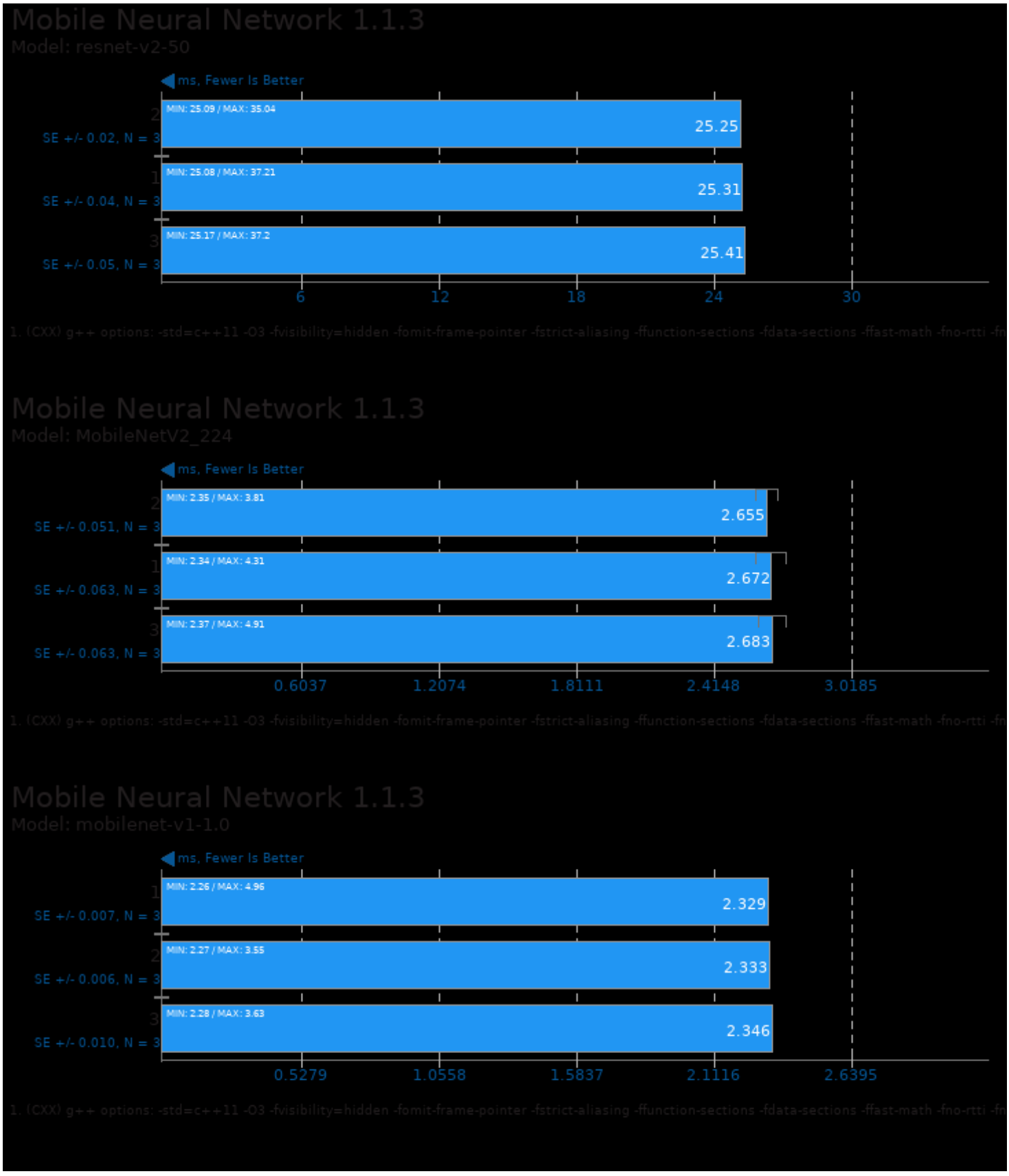

oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
2
SE +/- 3.80, N = 3
MIN: 3391.39
3405.32
3
SE +/- 4.35, N = 3
MIN: 3393.27
3405.99
1
SE +/- 5.97, N = 3
MIN: 3391.46
3408.16
700
1400
2100
2800
3500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
2
SE +/- 1.72, N = 3
MIN: 1843.95
1851.14
3
SE +/- 0.20, N = 3
MIN: 1846.88
1852.05
1
SE +/- 0.88, N = 3
MIN: 1846.26
1852.13
400
800
1200
1600
2000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
2
SE +/- 0.58, N = 3
MIN: 3406.86
3413.02
3
SE +/- 0.89, N = 3
MIN: 3407.32
3413.88
1
SE +/- 3.64, N = 3
MIN: 3404.15
3414.52
700
1400
2100
2800
3500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

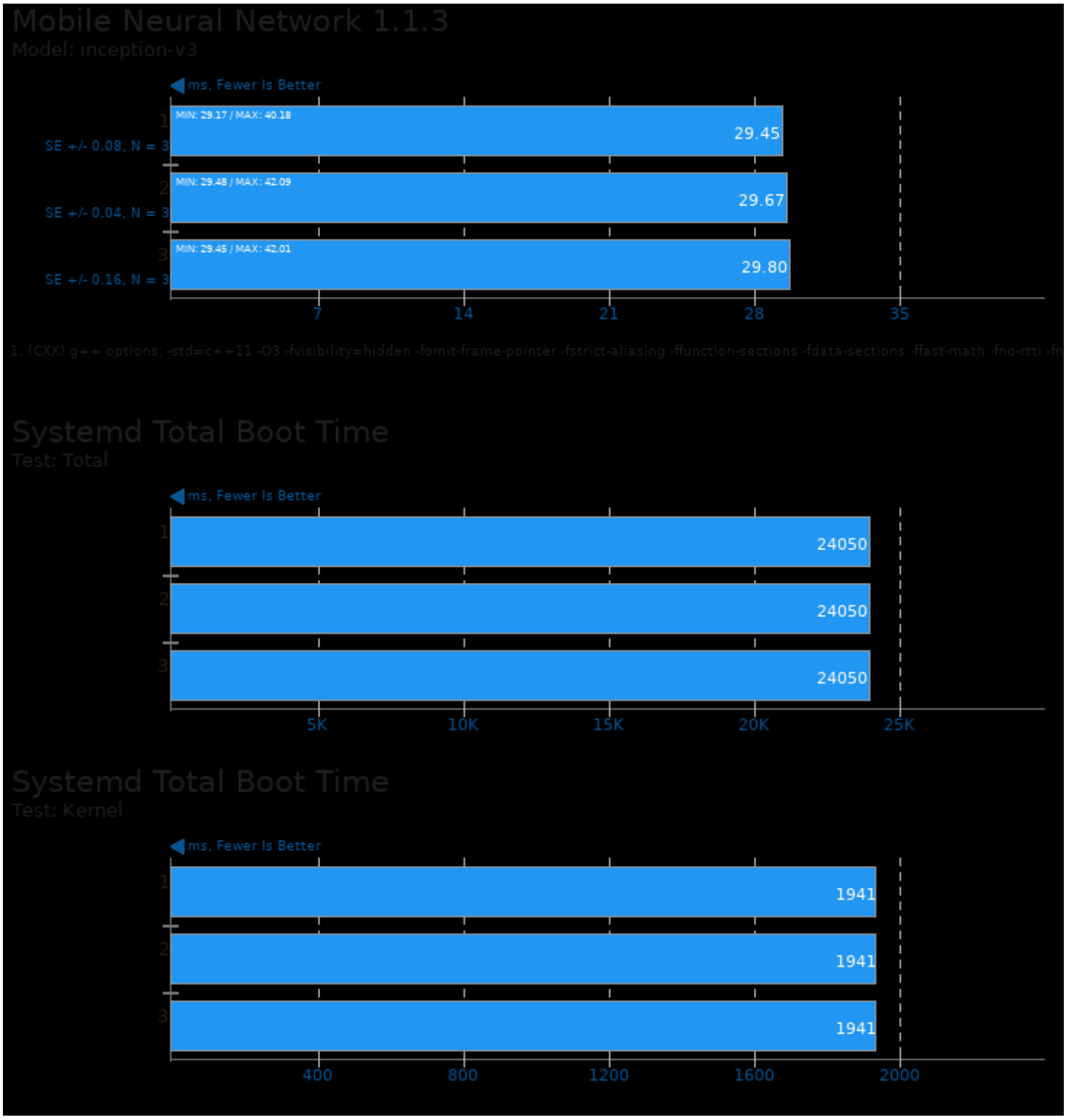
# 990KS March


oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
MIN: 1844.82
1850.82
SE +/- 0.16, N = 3
MIN: 1843.57
1851.30
SE +/- 1.14, N = 3
MIN: 1846.85
1852.26
SE +/- 0.58, N = 3
400
800
1200
1600
2000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
MIN: 3.09
3.14943
SE +/- 0.00951, N = 3
MIN: 3.1
3.15157
SE +/- 0.00442, N = 3
MIN: 3.1
3.15433
SE +/- 0.00701, N = 3
0.7097
1.4194
2.1291
2.8388
3.5485
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
MIN: 3402.03
3413.97
SE +/- 2.52, N = 3
MIN: 3409.68
3415.35
SE +/- 0.66, N = 3
MIN: 3408.23
3445.23
SE +/- 26.13, N = 3
700
1400
2100
2800
3500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

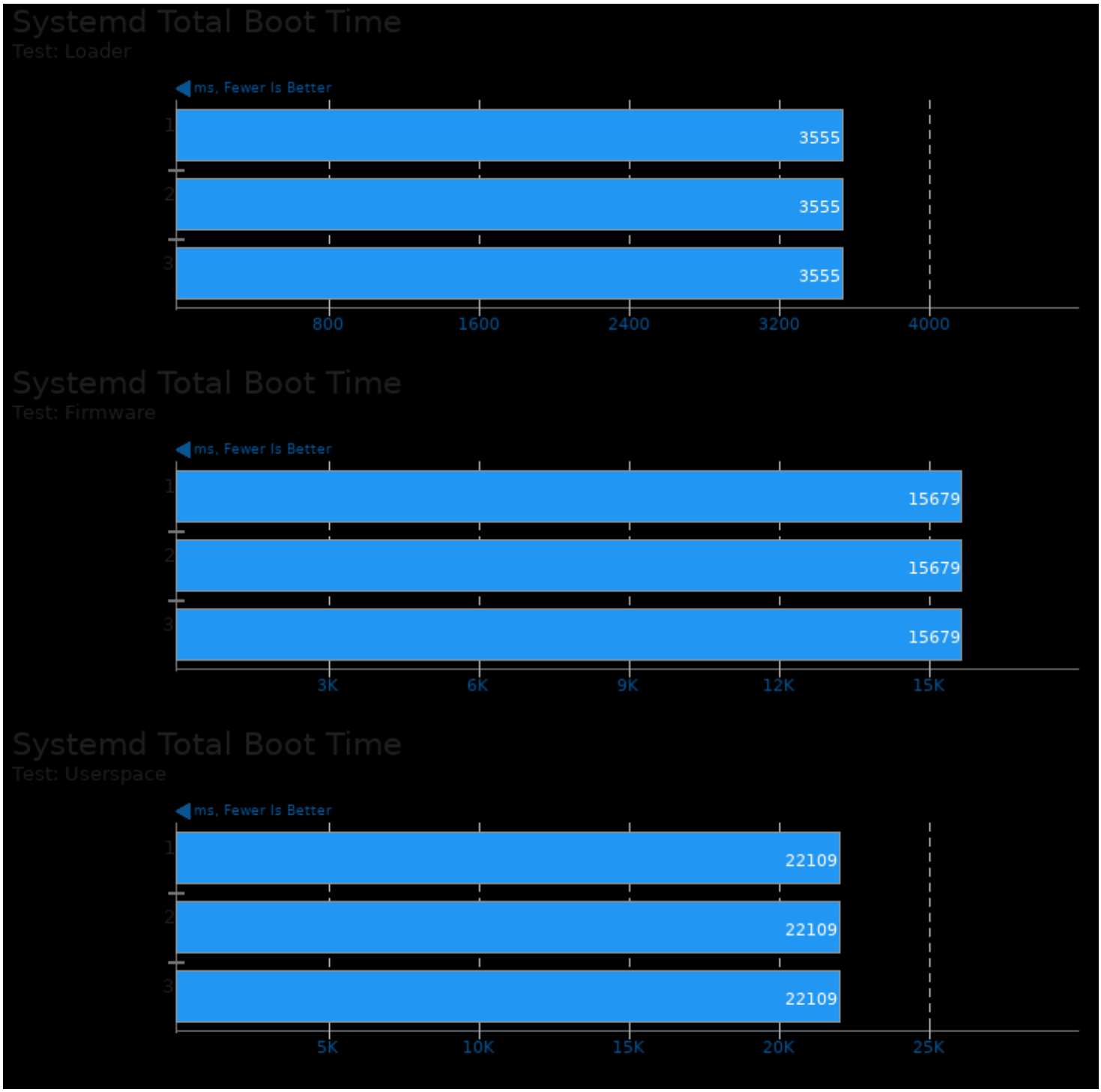
# 990KS March

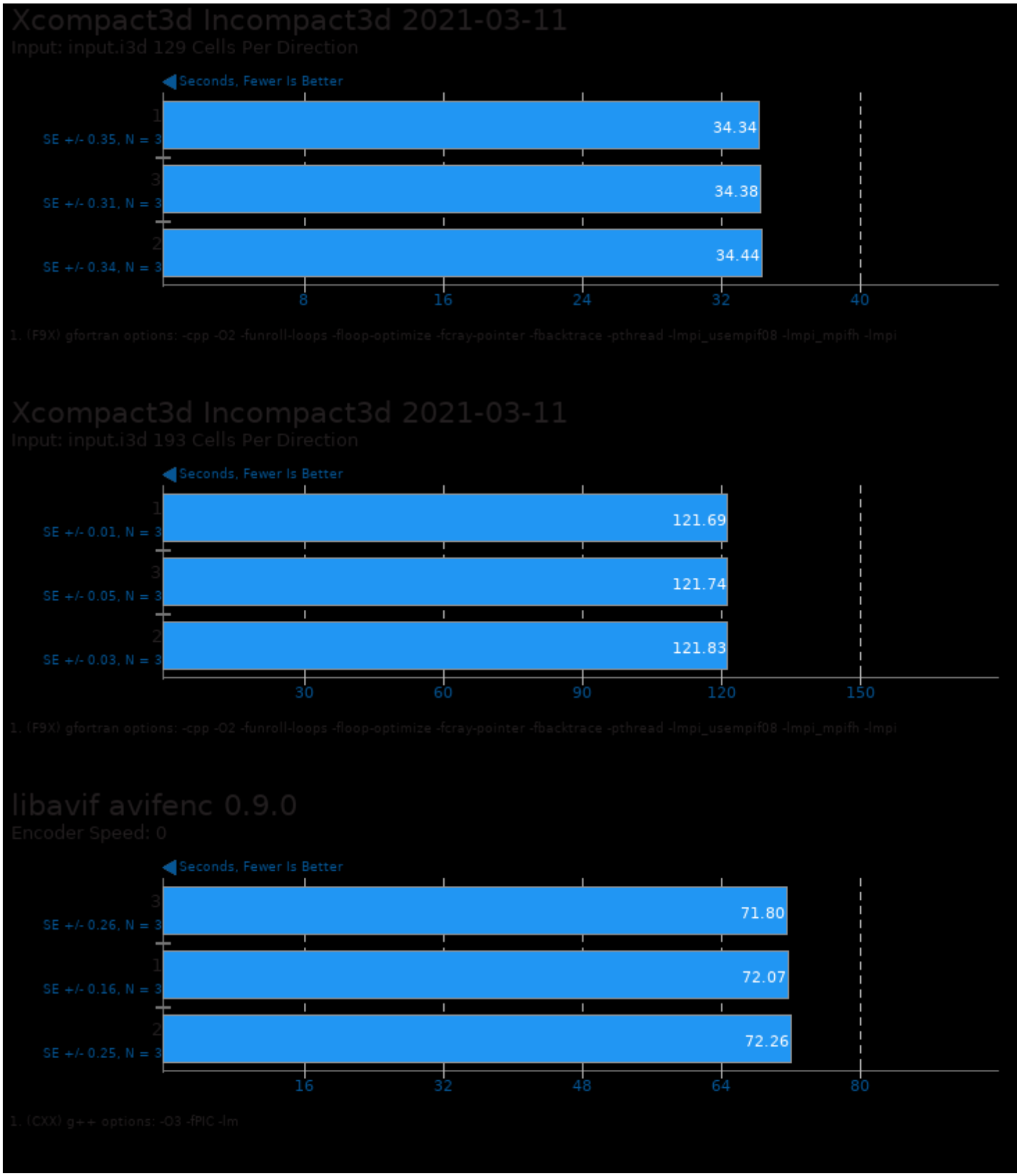

oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
2
MIN: 1841.63
1851.22
SE +/- 1.24, N = 3
3
MIN: 1846.77
1854.40
SE +/- 1.53, N = 3
1
MIN: 1847.25
1854.88
SE +/- 3.26, N = 3
400
800
1200
1600
2000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
2
MIN: 3.17
3.43359
SE +/- 0.00274, N = 3
3
MIN: 3.18
3.43914
SE +/- 0.00188, N = 3
1
MIN: 3.15
3.44003
SE +/- 0.00410, N = 3
0.774
1.548
2.322
3.096
3.87
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
Mobile Neural Network 1.1.3
Model: SqueezeNetV1.0
ms, Fewer Is Better
2
MIN: 4.68 / MAX: 5.58
4.882
SE +/- 0.030, N = 3
1
MIN: 4.71 / MAX: 7.4
4.899
SE +/- 0.029, N = 3
3
MIN: 4.65 / MAX: 16.5
4.943
SE +/- 0.027, N = 3
1.1122
2.2244
3.3366
4.4488
5.561
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn


Mobile Neural Network 1.1.3
Model: resnet-v2-50
ms, Fewer Is Better
MIN: 25.09 / MAX: 35.04
25.25
SE +/- 0.02, N = 3
MIN: 25.08 / MAX: 37.21
25.31
SE +/- 0.04, N = 3
MIN: 25.17 / MAX: 37.2
25.41
SE +/- 0.05, N = 3
6
12
18
24
30
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Mobile Neural Network 1.1.3
Model: MobileNetV2_224
ms, Fewer Is Better
MIN: 2.35 / MAX: 3.81
2.655
SE +/- 0.051, N = 3
MIN: 2.34 / MAX: 4.31
2.672
SE +/- 0.063, N = 3
MIN: 2.37 / MAX: 4.91
2.683
SE +/- 0.063, N = 3
0.6037
1.2074
1.8111
2.4148
3.0185
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Mobile Neural Network 1.1.3
Model: mobilenet-v1-1.0
ms, Fewer Is Better
MIN: 2.26 / MAX: 4.96
2.329
SE +/- 0.007, N = 3
MIN: 2.27 / MAX: 3.55
2.333
SE +/- 0.006, N = 3
MIN: 2.28 / MAX: 3.63
2.346
SE +/- 0.010, N = 3
0.5279
1.0558
1.5837
2.1116
2.6395
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv

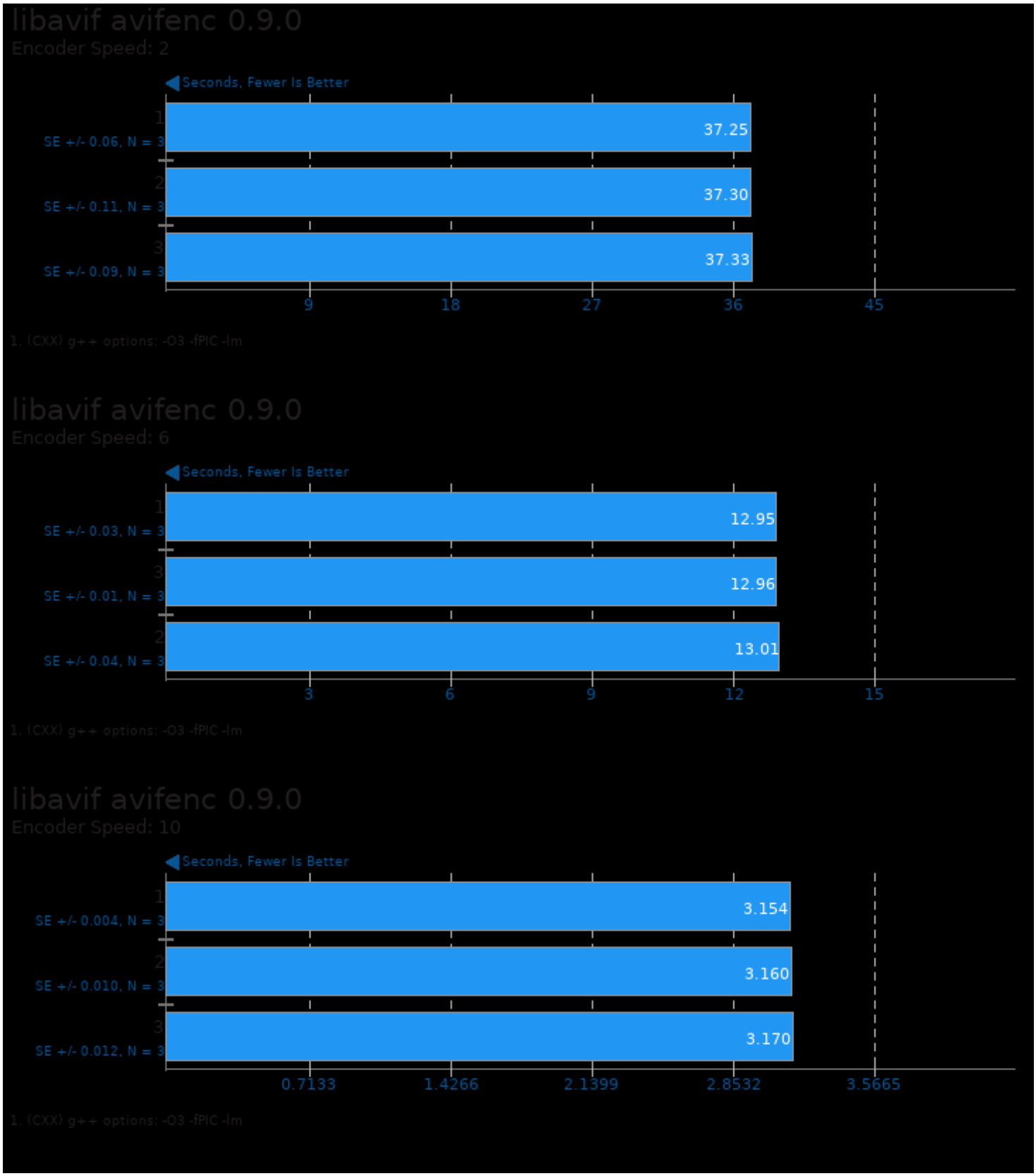

Mobile Neural Network 1.1.3
Model: inception-v3
ms, Fewer Is Better
MIN: 29.17 / MAX: 40.18
29.45
SE +/- 0.08, N = 3
MIN: 29.48 / MAX: 42.09
29.67
SE +/- 0.04, N = 3
MIN: 29.45 / MAX: 42.01
29.80
SE +/- 0.16, N = 3
7
14
21
28
35
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Systemd Total Boot Time
Test: Total
ms, Fewer Is Better
24050
24050
24050
5K
10K
15K
20K
25K
Systemd Total Boot Time
Test: Kernel
ms, Fewer Is Better
1941
1941
1941
400
800
1200
1600
2000

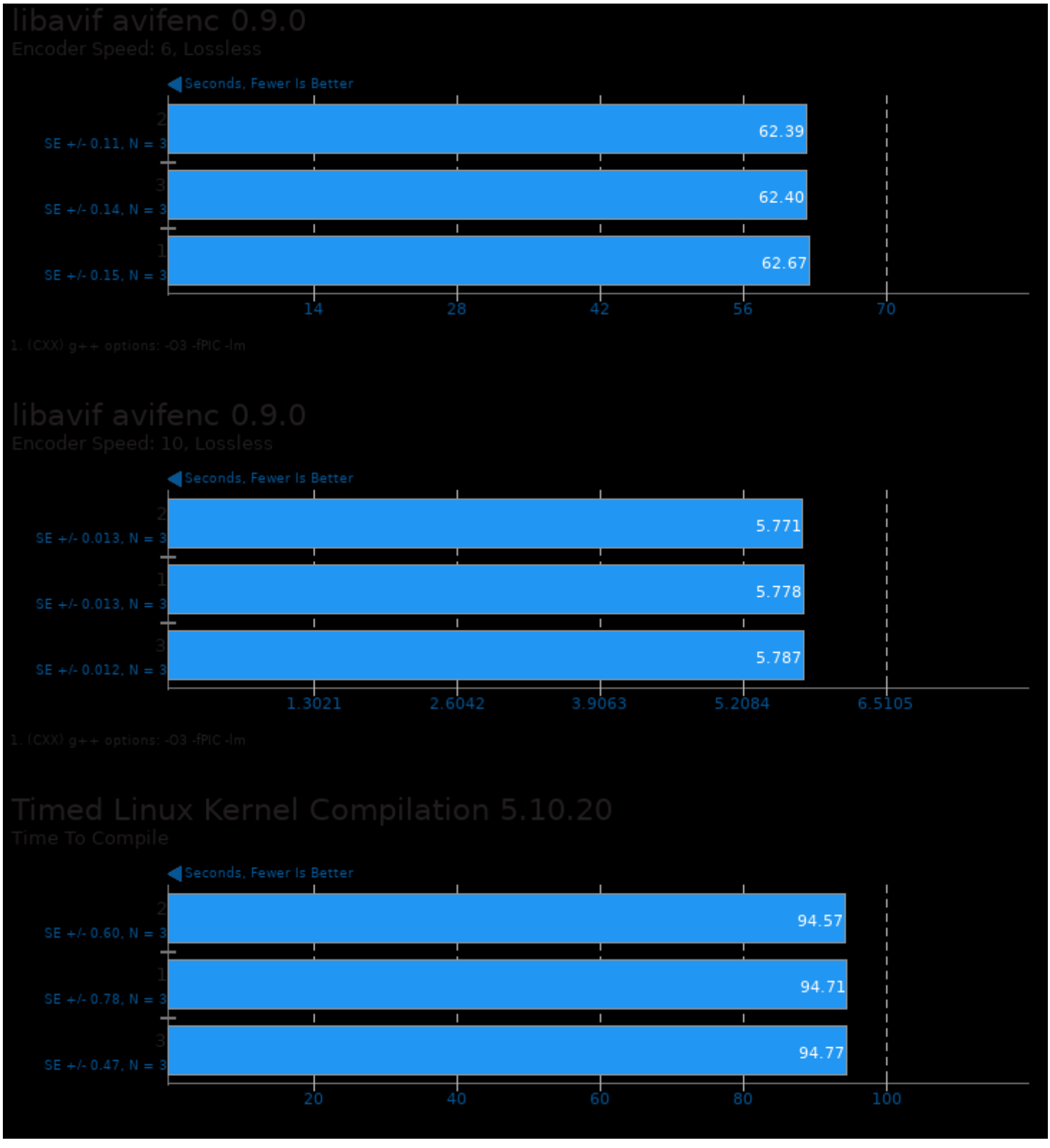
# 990KS March


Systemd Total Boot Time
Test: Loader
ms, Fewer Is Better
1
2
3
3555
3555
3555
800
1600
2400
3200
4000
Systemd Total Boot Time
Test: Firmware
ms, Fewer Is Better
1
2
3
15679
15679
15679
3K
6K
9K
12K
15K
Systemd Total Boot Time
Test: Userspace
ms, Fewer Is Better
1
2
3
22109
22109
22109
5K
10K
15K
20K
25K

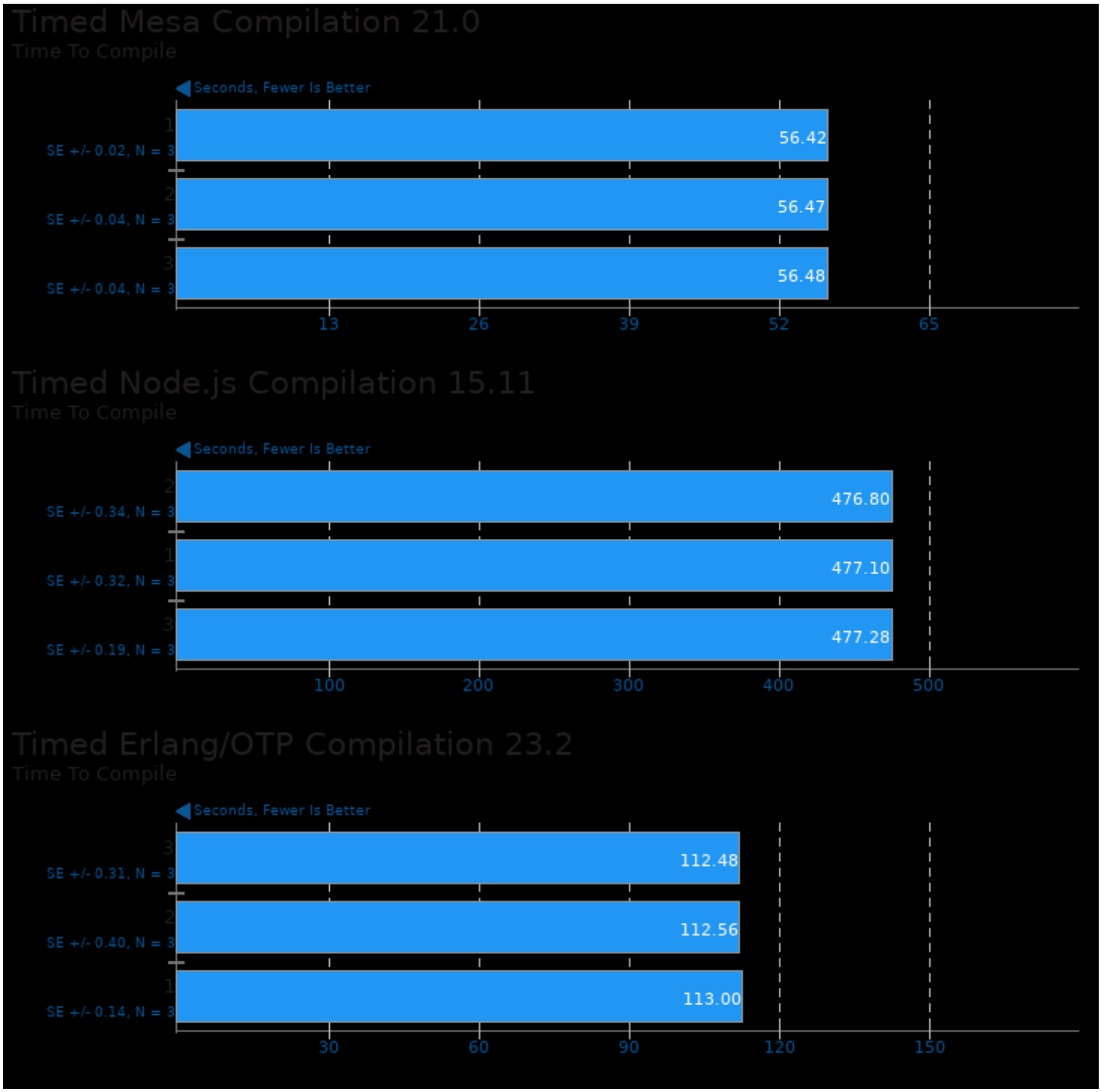

Xcompact3d Incompact3d 2021-03-11
Input: input.i3d 129 Cells Per Direction
Seconds, Fewer Is Better
1
SE +/- 0.35, N = 3
34.34
3
SE +/- 0.31, N = 3
34.38
2
SE +/- 0.34, N = 3
34.44
8
16
24
32
40
1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
Xcompact3d Incompact3d 2021-03-11
Input: input.i3d 193 Cells Per Direction
Seconds, Fewer Is Better
1
SE +/- 0.01, N = 3
121.69
3
SE +/- 0.05, N = 3
121.74
2
SE +/- 0.03, N = 3
121.83
30
60
90
120
150
1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
libavif avifenc 0.9.0
Encoder Speed: 0
Seconds, Fewer Is Better
3
SE +/- 0.26, N = 3
71.80
1
SE +/- 0.16, N = 3
72.07
2
SE +/- 0.25, N = 3
72.26
16
32
48
64
80
1. (CXX) g++ options: -O3 -fPIC -lm

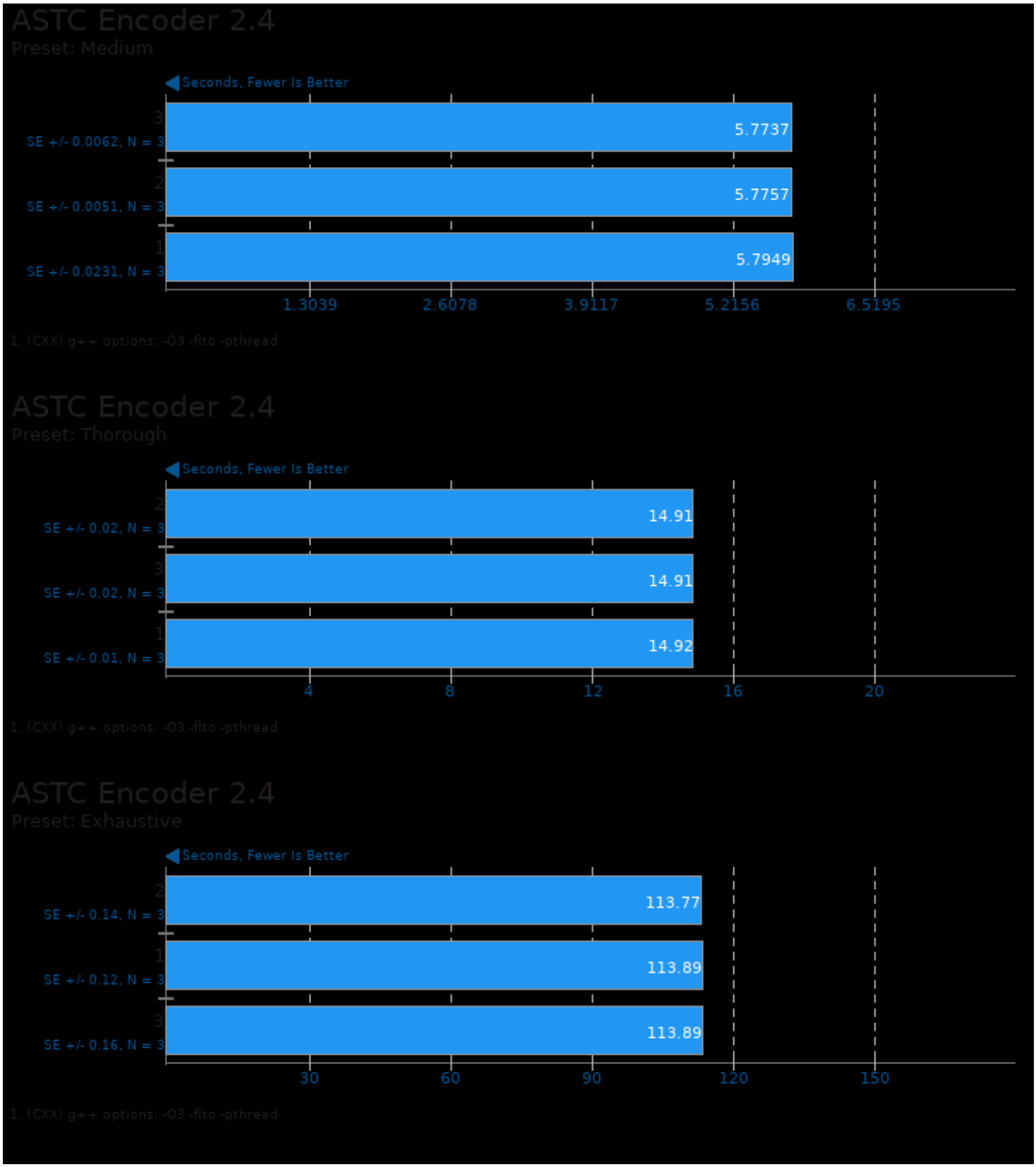
# 990KS March

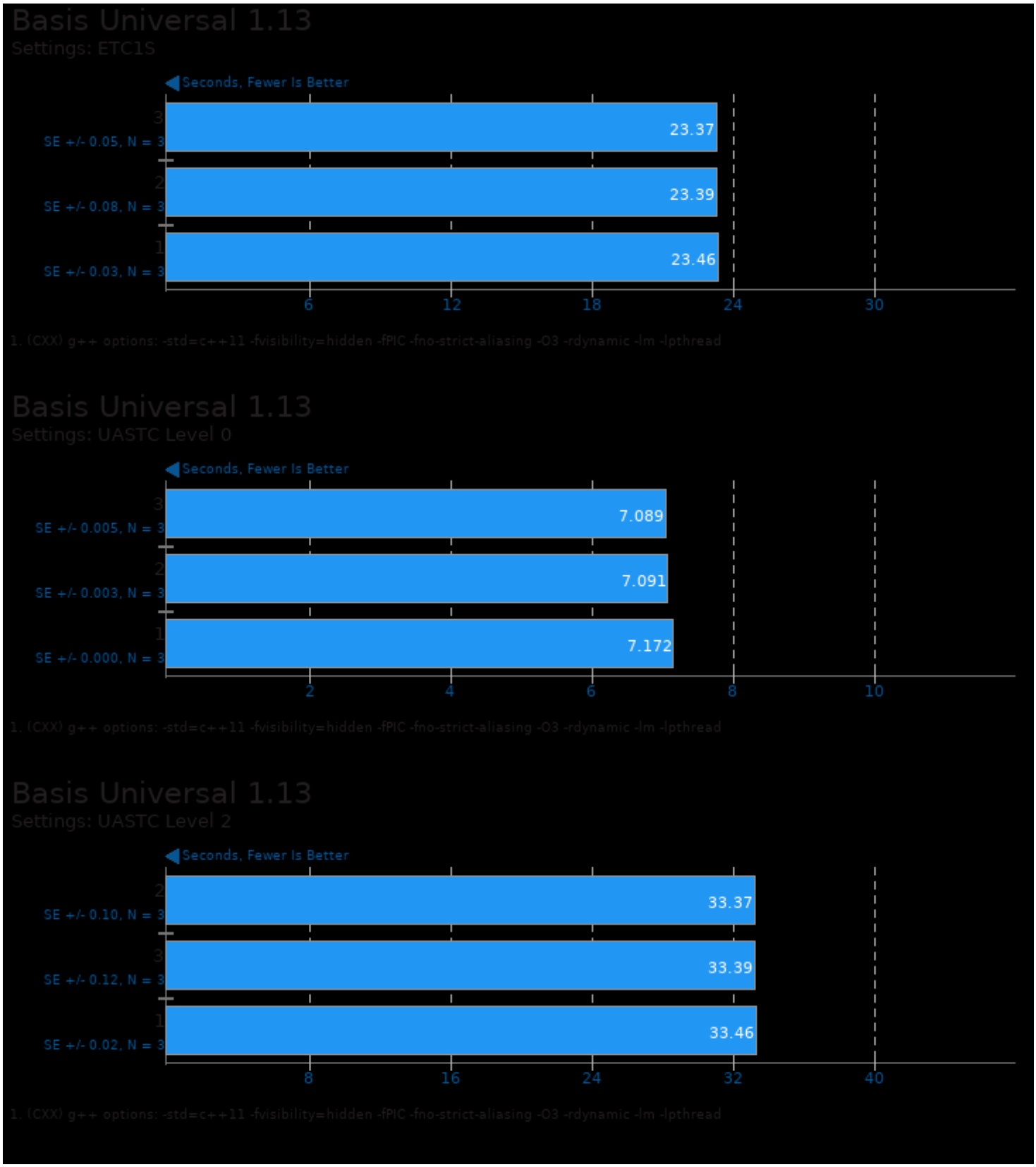

libavif avifenc 0.9.0
Encoder Speed: 2
Seconds, Fewer Is Better
1
SE +/- 0.06, N = 3
37.25
2
SE +/- 0.11, N = 3
37.30
3
SE +/- 0.09, N = 3
37.33
9
18
27
36
45
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 6
Seconds, Fewer Is Better
1
SE +/- 0.03, N = 3
12.95
3
SE +/- 0.01, N = 3
12.96
2
SE +/- 0.04, N = 3
13.01
3
6
9
12
15
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 10
Seconds, Fewer Is Better
1
SE +/- 0.004, N = 3
3.154
2
SE +/- 0.010, N = 3
3.160
3
SE +/- 0.012, N = 3
3.170
0.7133
1.4266
2.1399
2.8532
3.5665
1. (CXX) g++ options: -O3 -fPIC -lm


libavif avifenc 0.9.0
Encoder Speed: 6, Lossless
Seconds, Fewer Is Better
2
SE +/- 0.11, N = 3
62.39
3
SE +/- 0.14, N = 3
62.40
1
SE +/- 0.15, N = 3
62.67
14
28
42
56
70
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 10, Lossless
Seconds, Fewer Is Better
2
SE +/- 0.013, N = 3
5.771
1
SE +/- 0.013, N = 3
5.778
3
SE +/- 0.012, N = 3
5.787
1.3021
2.6042
3.9063
5.2084
6.5105
1. (CXX) g++ options: -O3 -fPIC -lm
Timed Linux Kernel Compilation 5.10.20
Time To Compile
Seconds, Fewer Is Better
2
SE +/- 0.60, N = 3
94.57
1
SE +/- 0.78, N = 3
94.71
3
SE +/- 0.47, N = 3
94.77
20
40
60
80
100

# 990KS March

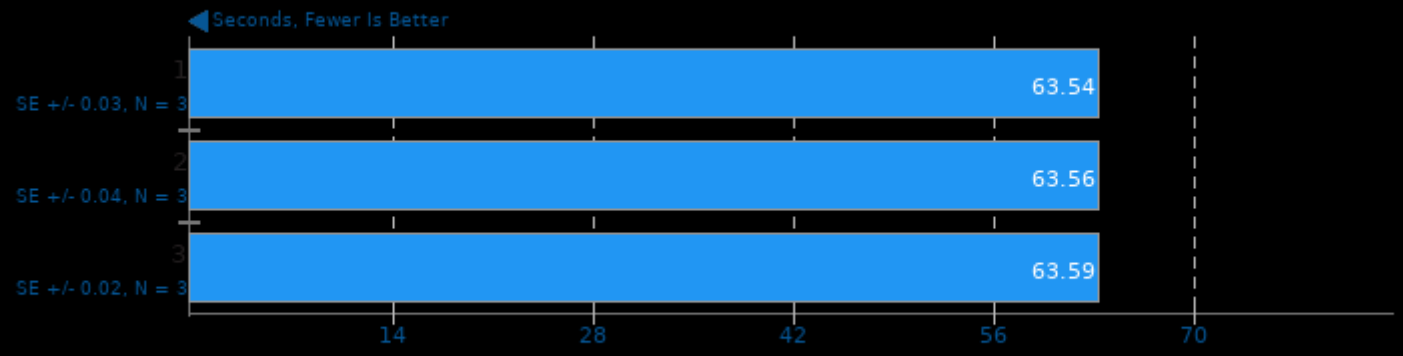

Timed Mesa Compilation 21.0
Time To Compile
Seconds, Fewer Is Better
1
SE +/- 0.02, N = 3
56.42
2
SE +/- 0.04, N = 3
56.47
3
SE +/- 0.04, N = 3
56.48
13
26
39
52
65
Timed Node.js Compilation 15.11
Time To Compile
Seconds, Fewer Is Better
2
SE +/- 0.34, N = 3
476.80
1
SE +/- 0.32, N = 3
477.10
3
SE +/- 0.19, N = 3
477.28
100
200
300
400
500
Timed Erlang/OTP Compilation 23.2
Time To Compile
Seconds, Fewer Is Better
3
SE +/- 0.31, N = 3
112.48
2
SE +/- 0.40, N = 3
112.56
1
SE +/- 0.14, N = 3
113.00
30
60
90
120
150


ASTC Encoder 2.4
Preset: Medium
Seconds, Fewer Is Better
3
SE +/- 0.0062, N = 3
5.7737
2
SE +/- 0.0051, N = 3
5.7757
1
SE +/- 0.0231, N = 3
5.7949
1.3039
2.6078
3.9117
5.2156
6.5195
1. (CXX) g++ options: -O3 -flto -pthread
ASTC Encoder 2.4
Preset: Thorough
Seconds, Fewer Is Better
2
SE +/- 0.02, N = 3
14.91
3
SE +/- 0.02, N = 3
14.91
1
SE +/- 0.01, N = 3
14.92
4
8
12
16
20
1. (CXX) g++ options: -O3 -flto -pthread
ASTC Encoder 2.4
Preset: Exhaustive
Seconds, Fewer Is Better
2
SE +/- 0.14, N = 3
113.77
1
SE +/- 0.12, N = 3
113.89
3
SE +/- 0.16, N = 3
113.89
30
60
90
120
150
1. (CXX) g++ options: -O3 -flto -pthread


Basis Universal 1.13
Settings: ETC1S
Seconds, Fewer Is Better
SE +/- 0.05, N = 3
23.37
SE +/- 0.08, N = 3
23.39
SE +/- 0.03, N = 3
23.46
6
12
18
24
30
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
Basis Universal 1.13
Settings: UASTC Level 0
Seconds, Fewer Is Better
SE +/- 0.005, N = 3
7.089
SE +/- 0.003, N = 3
7.091
SE +/- 0.000, N = 3
7.172
2
4
6
8
10
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
Basis Universal 1.13
Settings: UASTC Level 2
Seconds, Fewer Is Better
SE +/- 0.10, N = 3
33.37
SE +/- 0.12, N = 3
33.39
SE +/- 0.02, N = 3
33.46
8
16
24
32
40
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

## Basis Universal 1.13

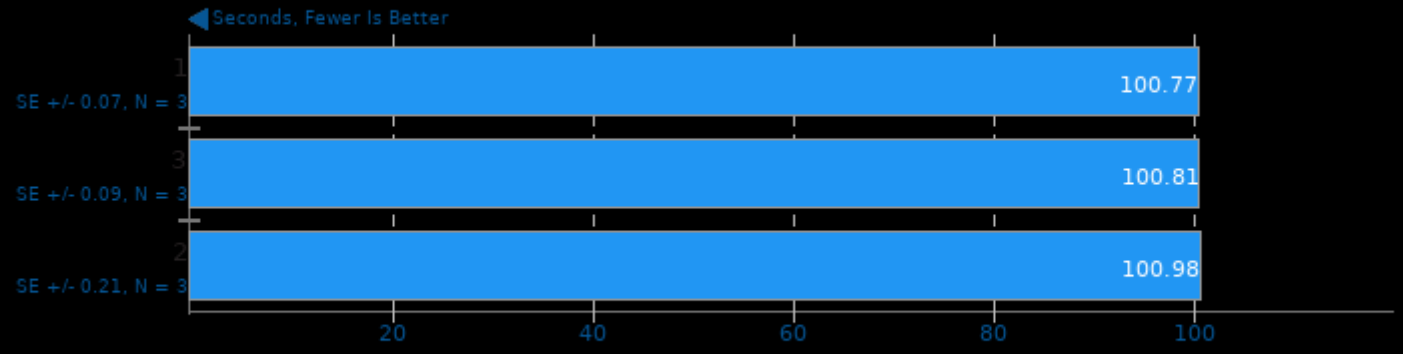
Settings: UASTC Level 3




1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

## OpenSCAD

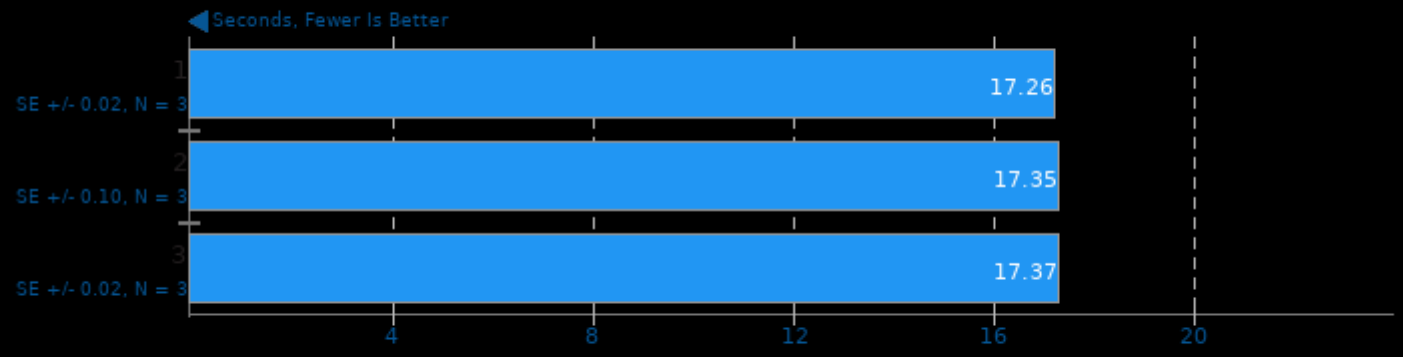
Render: Pistol




1. OpenSCAD version 2019.05

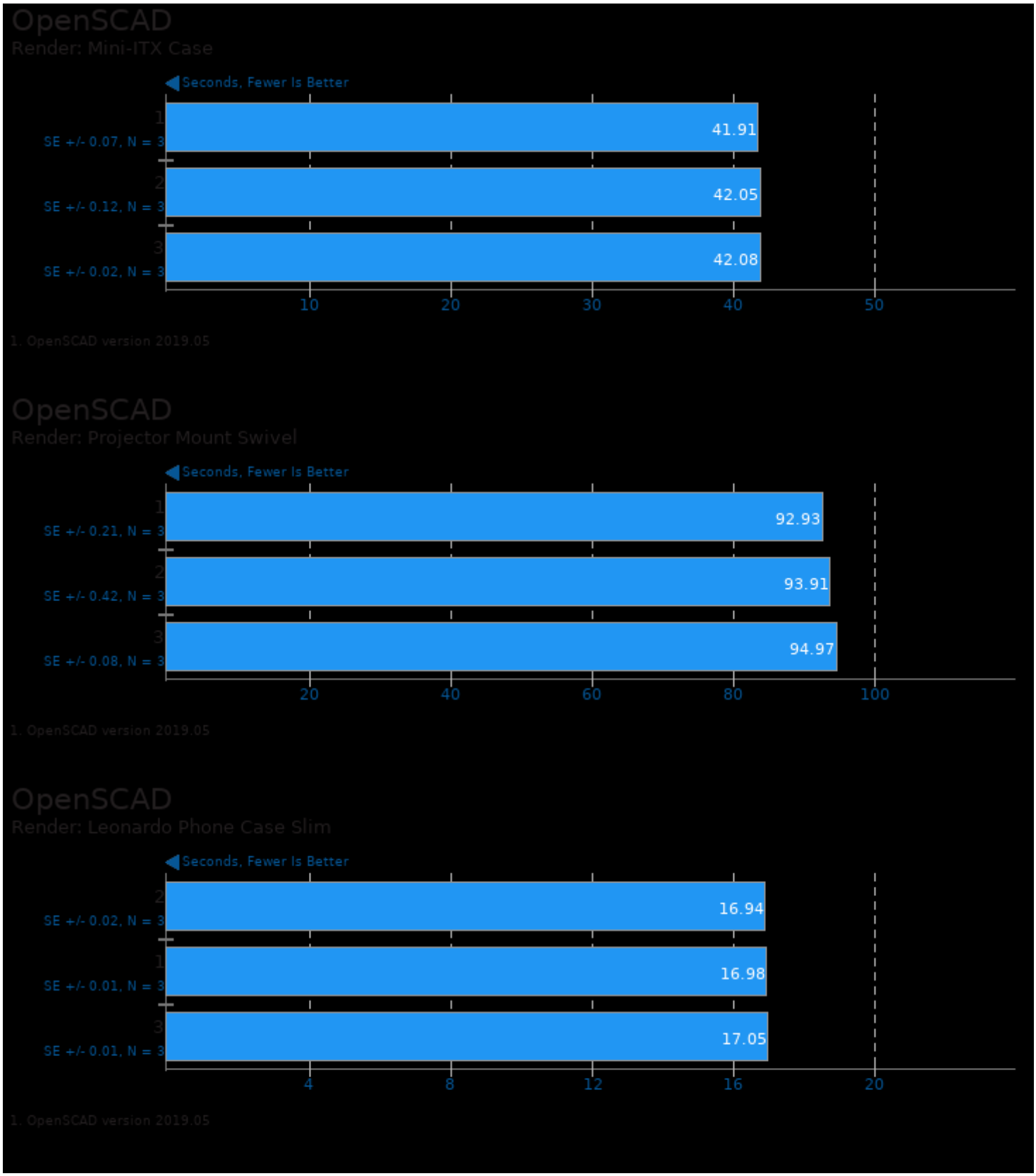
## OpenSCAD

Render: Retro Car



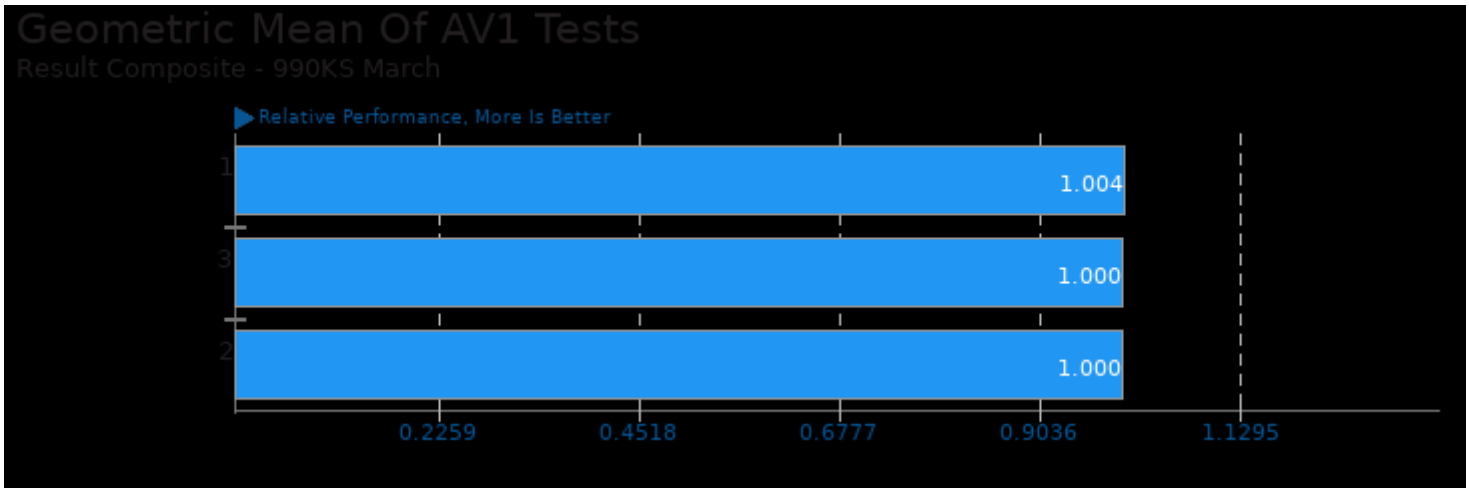

1. OpenSCAD version 2019.05

# 990KS March

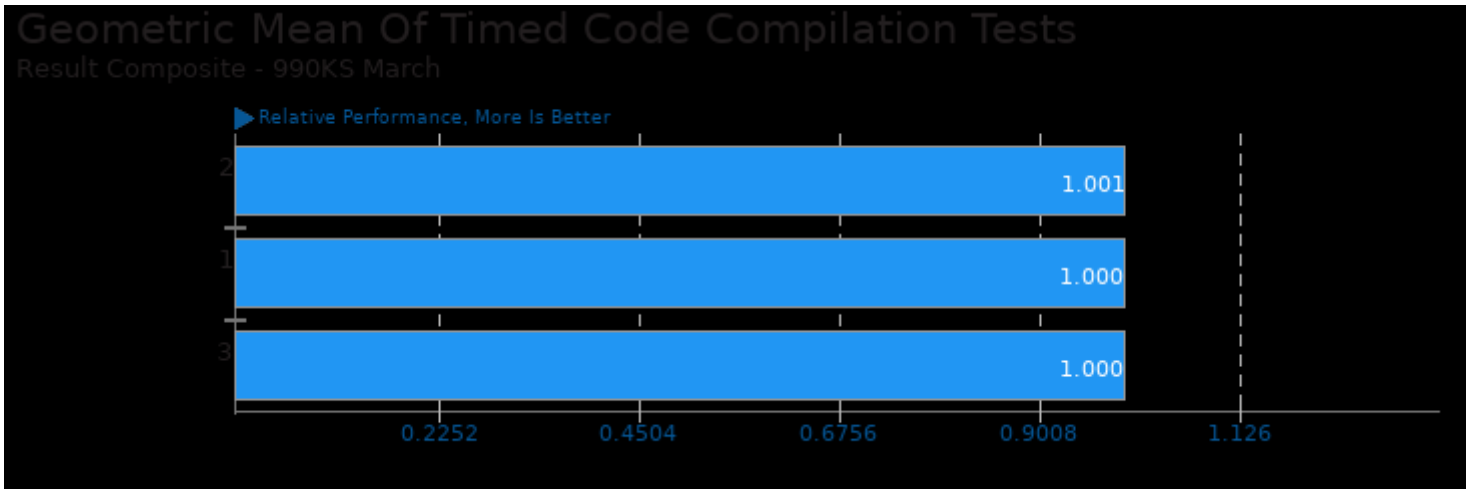

OpenSCAD
Render: Mini-ITX Case
Seconds, Fewer Is Better
1
SE +/- 0.07, N = 3
41.91
2
SE +/- 0.12, N = 3
42.05
3
SE +/- 0.02, N = 3
42.08
10
20
30
40
50
1. OpenSCAD version 2019.05
OpenSCAD
Render: Projector Mount Swivel
Seconds, Fewer Is Better
1
SE +/- 0.21, N = 3
92.93
2
SE +/- 0.42, N = 3
93.91
3
SE +/- 0.08, N = 3
94.97
20
40
60
80
100
1. OpenSCAD version 2019.05
OpenSCAD
Render: Leonardo Phone Case Slim
Seconds, Fewer Is Better
2
SE +/- 0.02, N = 3
16.94
1
SE +/- 0.01, N = 3
16.98
3
SE +/- 0.01, N = 3
17.05
4
8
12
16
20
1. OpenSCAD version 2019.05

# 990KS March

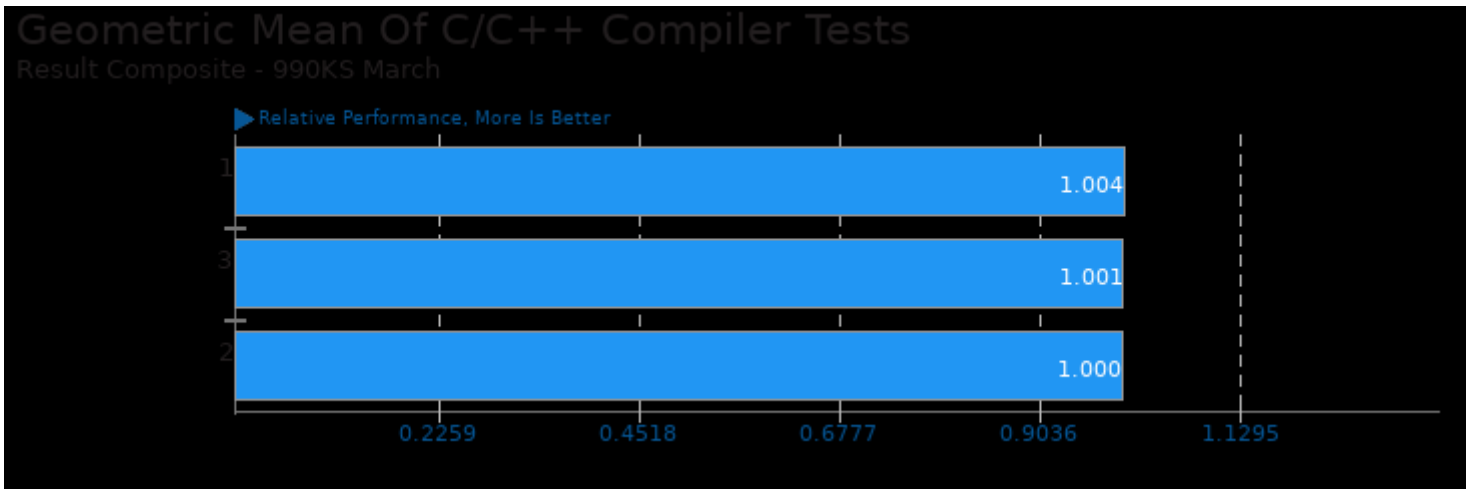
These geometric means are based upon test groupings / test suites for this result file.




Geometric mean based upon tests: pts/dav1d, pts/aom-av1 and pts/avifenc




Geometric mean based upon tests: pts/build-linux-kernel, pts/build-erlang, pts/build-nodejs and pts/build-mesa



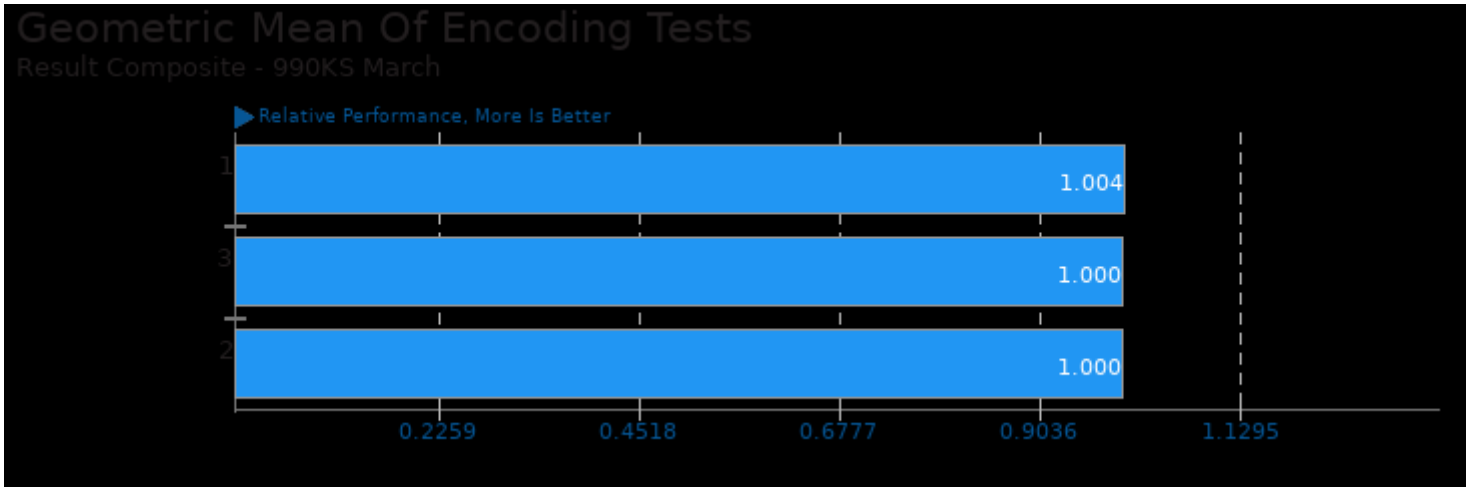

Geometric mean based upon tests: pts/stockfish, pts/dav1d, pts/compress-zstd, pts/aom-av1, pts/svt-vp9, pts/toybrot and pts/basis




Geometric mean based upon tests: pts/build-linux-kernel, pts/compress-zstd, pts/dav1d, pts/svt-hevc, pts/svt-vp9, pts/onednn, pts/stockfish, pts/sysbench and pts/botan

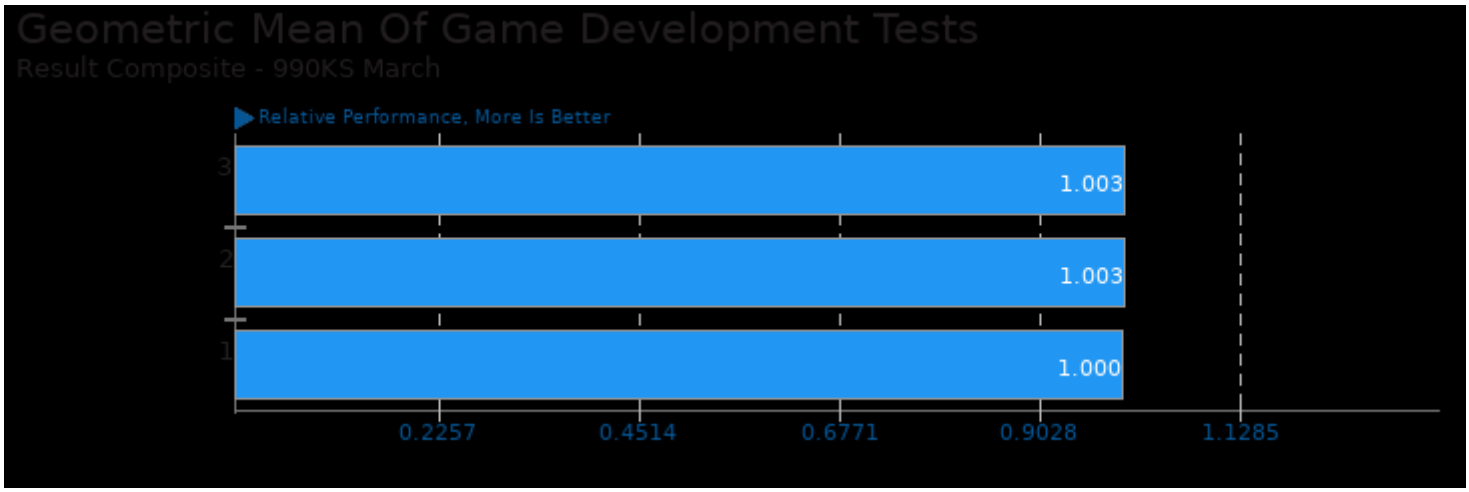



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1, pts/avifenc, pts/onednn, pts/basis, pts/astcenc and system/openscad

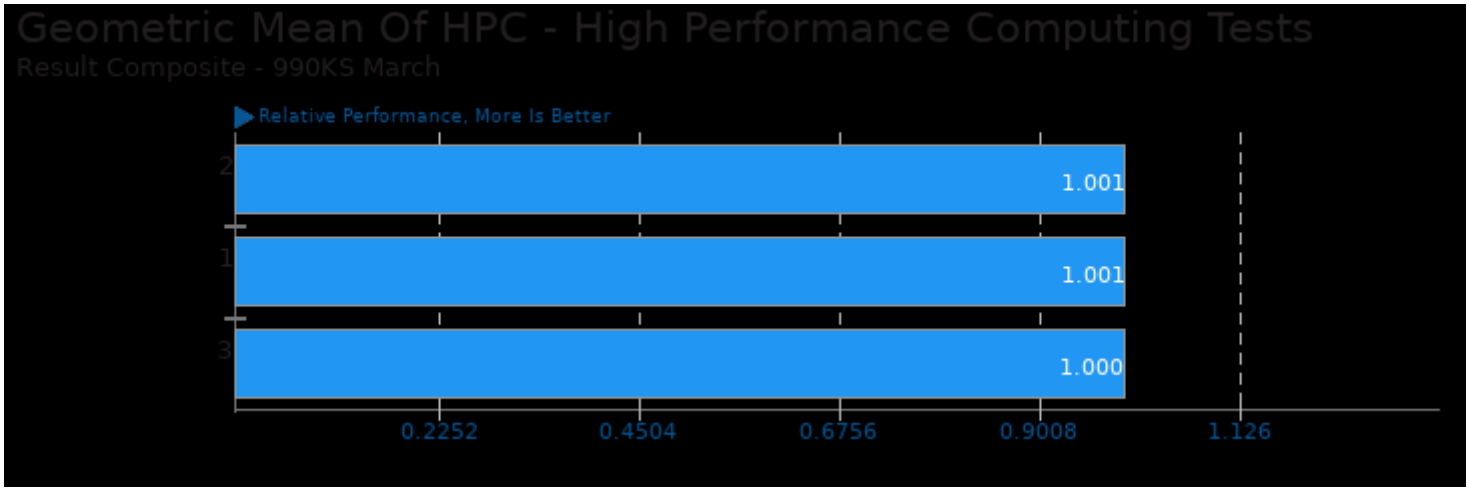



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1 and pts/avifenc

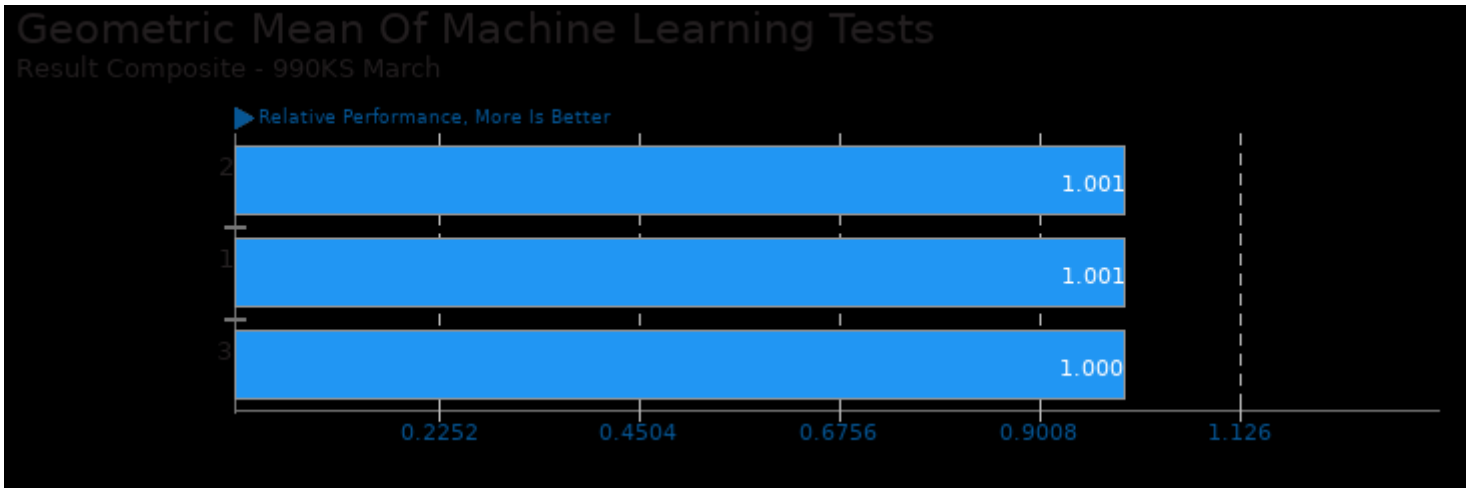
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Geometric mean based upon tests: pts/basis and pts/astcenc




Geometric mean based upon tests: pts/incompact3d, pts/mnn, pts/shoc and pts/onednn

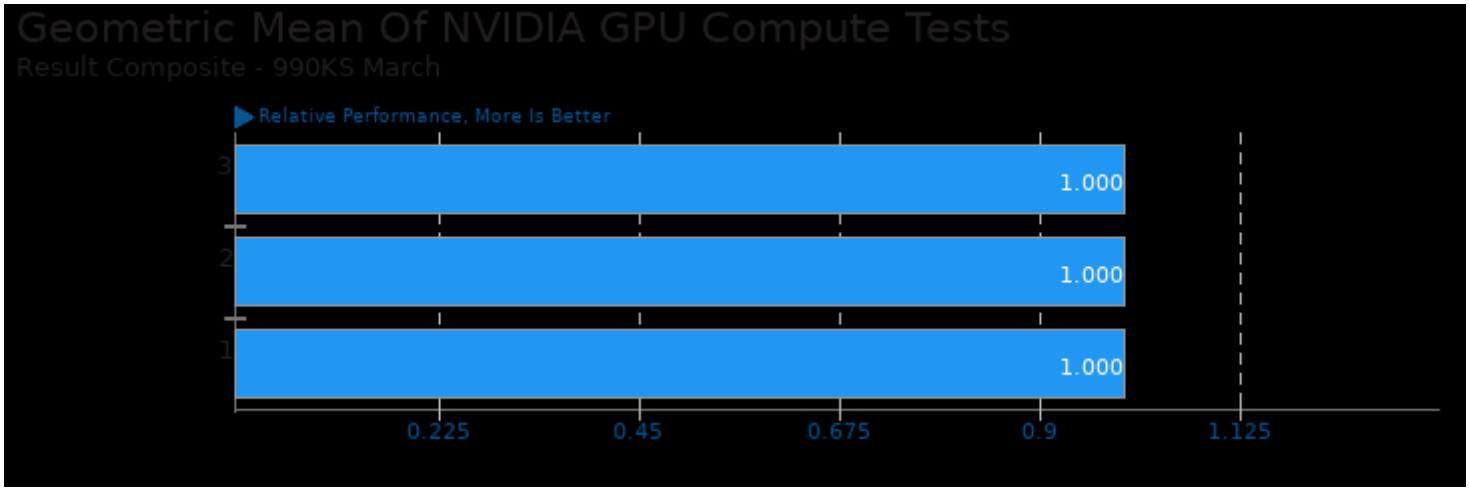



Geometric mean based upon tests: pts/mnn, pts/shoc and pts/onednn

# 990KS March




Geometric mean based upon tests: pts/sysbench, pts/stockfish, pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1, pts/avifenc, pts/onednn, pts/compress-zstd, pts/build-linux-kernel, pts/build-erlang, pts/build-nodejs and pts/build-mesa

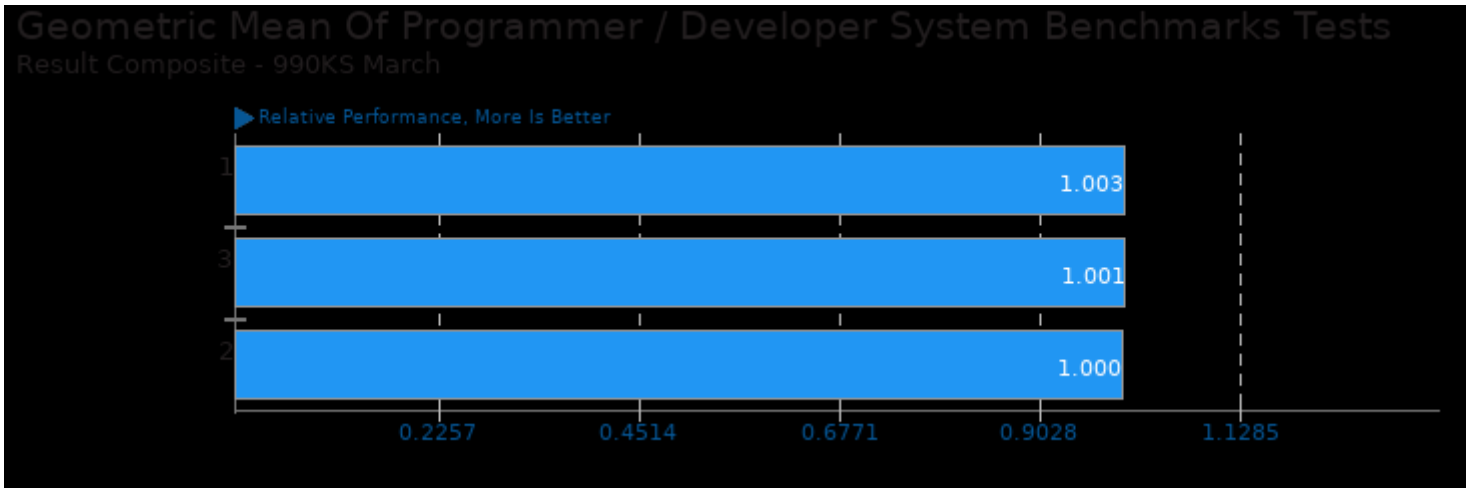



Geometric mean based upon tests: pts/viennacl and pts/shoc

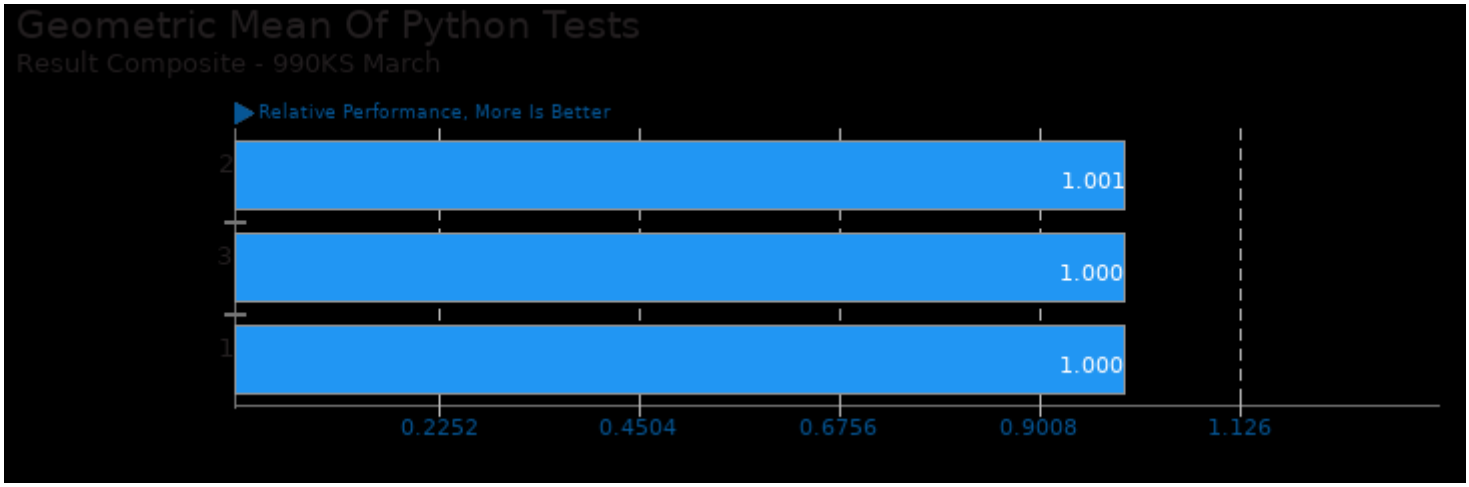



Geometric mean based upon tests: pts/shoc and pts/viennacl

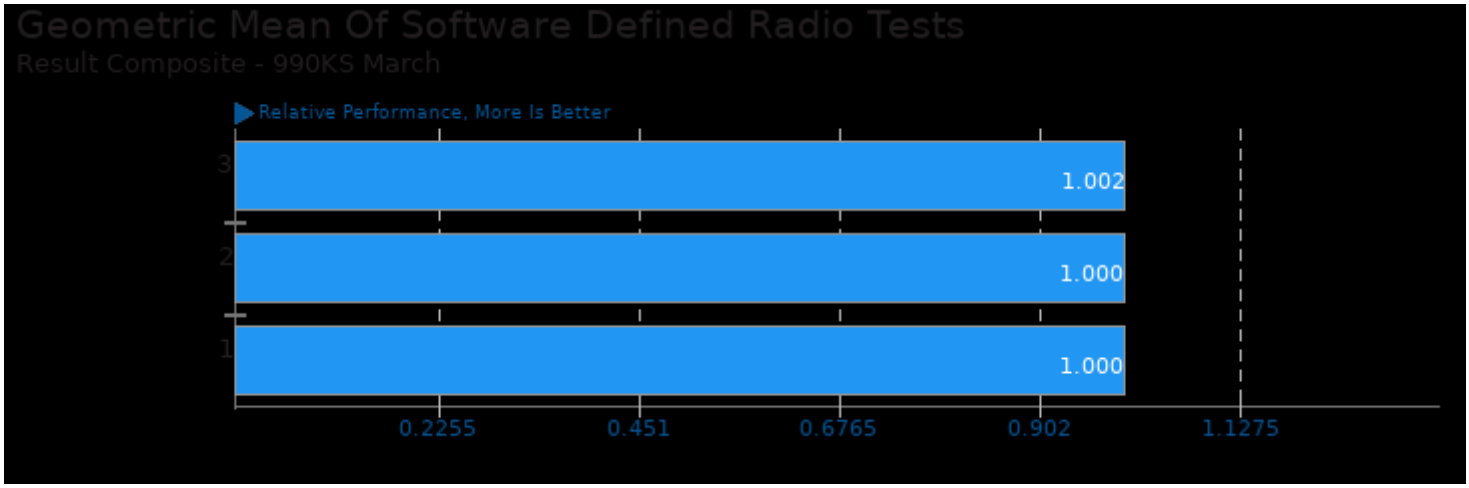
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Geometric mean based upon tests: pts/simdjson, pts/compress-zstd, pts/build-linux-kernel, pts/build-erlang, pts/build-nodejs and pts/build-mesa

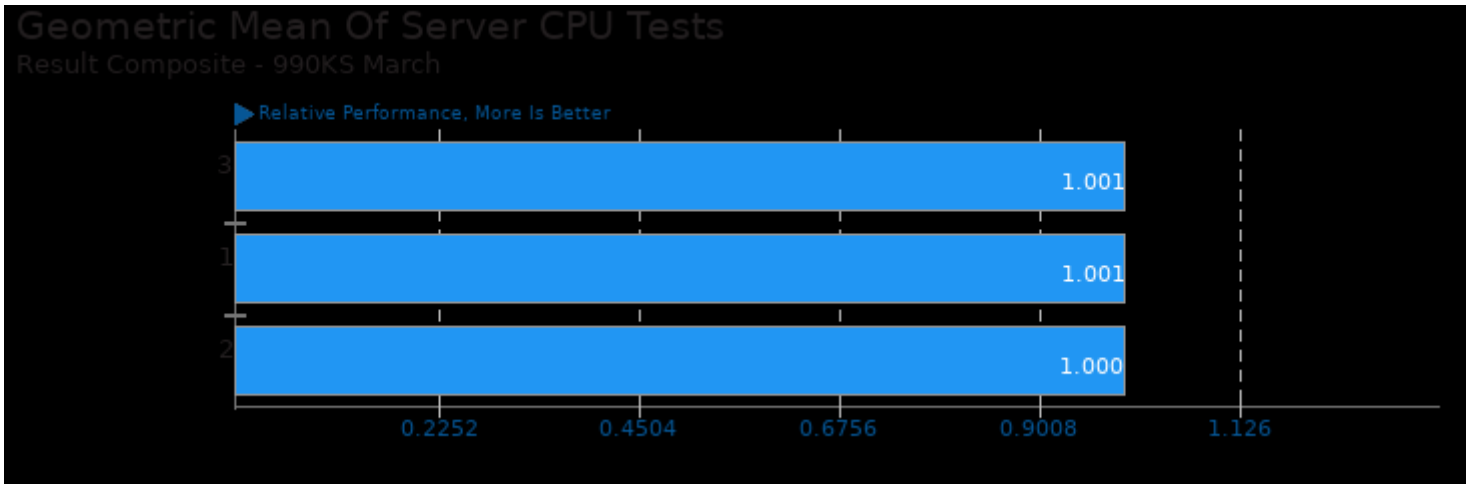



Geometric mean based upon tests: system/gnuradio, pts/systemd-boot-total, pts/build-mesa and pts/build-nodejs

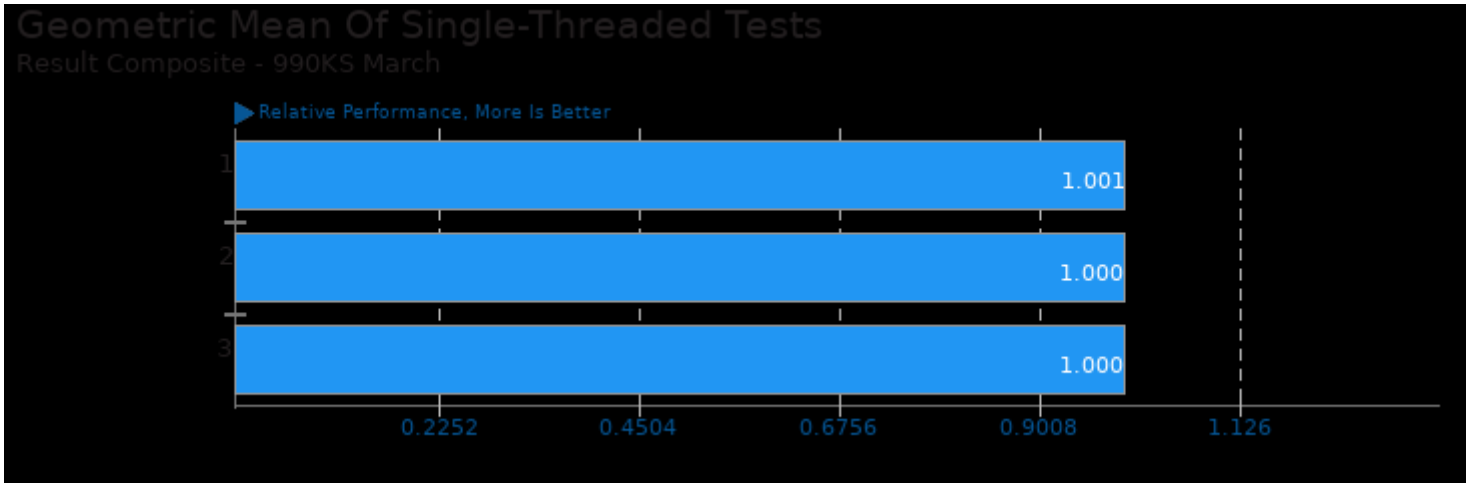



Geometric mean based upon tests: pts/liquid-dsp, pts/srslte, pts/luaradio and system/gnuradio

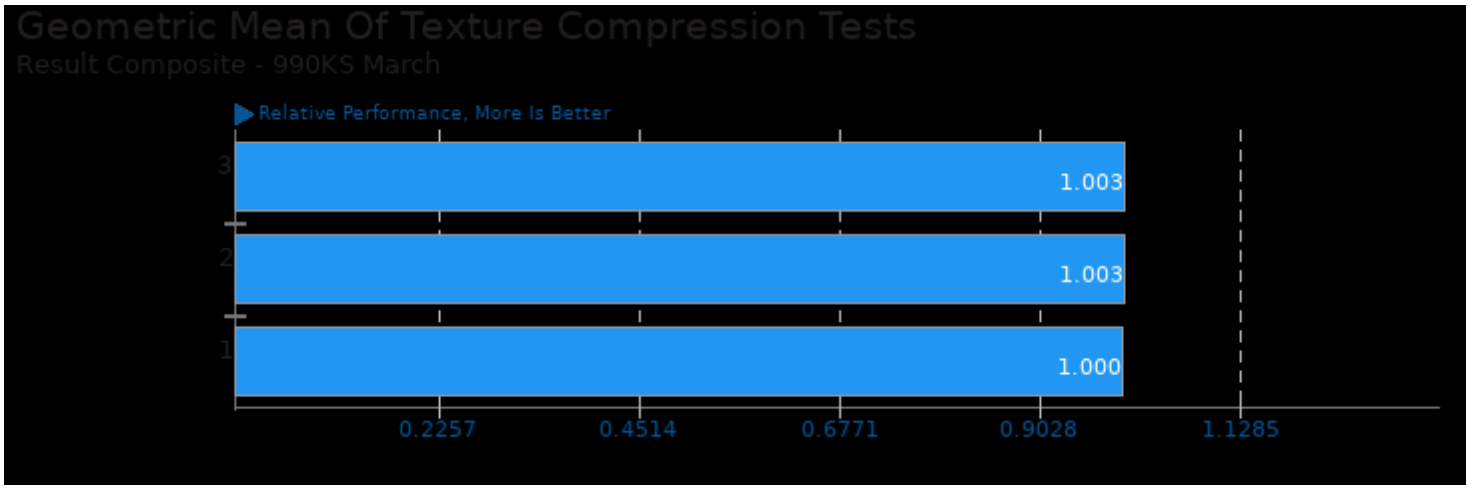
# 990KS March




Geometric mean based upon tests: pts/onednn, pts/svt-hevc, pts/svt-vp9, pts/dav1d, pts/stockfish, pts/build-linux-kernel, pts/compress-zstd and pts/sysbench

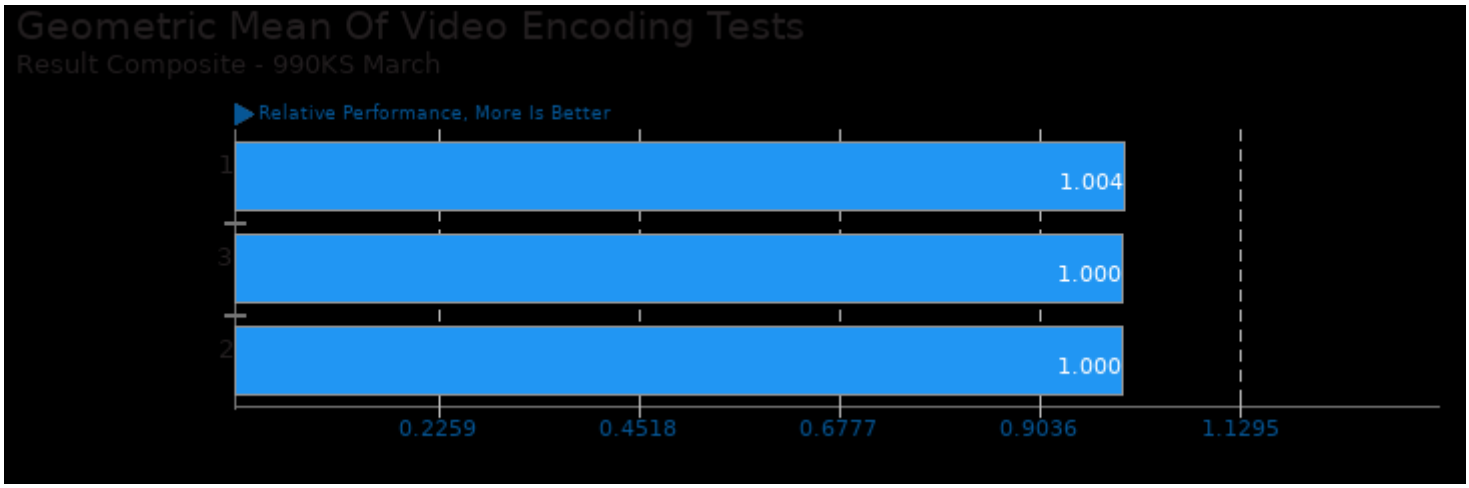



Geometric mean based upon tests: pts/gmpbench and pts/botan




Geometric mean based upon tests: pts/basis and pts/astcenc

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Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1 and pts/avifenc

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 08:17.*