# Randomization of Sparse Matrix by Vector Multiplication

# ABHISHEK JAIN, ISMAIL BUSTANY, and PAOLO D'ALBERTO

A sparse matrix by vector multiplication (SpMV) is simplified by the matrix non-zero elements and how we store them. There are many SpMV applications, many matrix storage formats, and thus algorithms. However, there is no optimality without considering the architecture: for example, the CPU is one among many.

By nature, randomization is resilient to counter techniques, thus suitable to avoid worst case scenarios because we tend to reduce to an average case; however, randomization does to the best case scenario the same thing it does to the worst case, it can nudge the optimal solution off. Like preconditioning, randomization is advantageous when the matrix is reused or a constant such as in the power method, Krilov's space, or convolutions for image classifications. Differently from preconditioning we do not change the values of the matrix, we randomize row and column of the matrix. We shall show that randomization is an optimization that any architecture may take advantage although in different ways. Most importantly, any developer can consider and deploy. We shall present cases where we can improve performance by 15% on AMD-based systems.

#### ACM Reference Format:

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Abhishek Jain, Ismail Bustany, and Paolo D'Alberto. 2020. Randomization of Sparse Matrix by Vector Multiplication . 1, 1 (June 2020), 26 pages.

#### 1 INTRODUCTION

The obious questions are what is randomization and why would we use it? We shall provide formal definitions in the following sections, in this context, we randomly permute rows and column of a sparse matrix before a (sparse) matrix by a (dense) vector operation. We do this because randomization is the poor man's preconditioning and we do not mean it in a pejorative sense.

Preconditioning is a method to help the convergence of an iterative solution, for example a sequence of matrix by vector operations. Each iteration does a better job in searching the space and converging to a solution. In general, it means better numerical properties and well defined properties of the matrix itself. It does not mean that each iteration is faster. We want to make each iteration faster. From a mathematical and scientific point of view may seem uninteresting. From the engineering and deployment point of view is just the beginning.

There is a common thread in the scientific community how to speed it up: multi-core systems. These are composed by multi-cores processors and GPUs. The main goal is to achieve a balanced work distribution and, when applicable, minimal communication [3, 4]. When storage strategy and algorithms must be considered together then GPUs provide the work horse for the current trust and research [1]. This research is towards optimal solutions and the authors strive for a clear and complete understanding of the software–hardware relation, and usually the hardware is composed of symmetric computational units. Interestingly, the SpMV's space and time complexity, which are small, may not warrant

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more performance because we end up using only one thousandth the capacity of the hardware. We may deploy efficient solutions: not necessarily faster but overall tailored for this. **FPGA or custom hardware one paragraph** 

At this stage, we have too many nobs and tools to tune: algorithms, data structures, and dedicated hardware (CPU, GPUs, Custom). This is a (very) hard problem and we are not here for the solution of the inverse problem: find the best Hardware-Software solution for the one matrix by vector product. We are here to provide tools, we may say naive tools, to help understand how the structure of the matrix may affect the HW-SW solution. Randomization, or versions of it, is already used by custom hardware to re-organize the data flow to reduce communications and computation bottle necks. We come to play in this arena to show *how* to use randomization if at all.

For the readers in the field of algorithms, sparse matrix by (dense) vector is basically a sorting algorithm. Bare with us, Sorting is a method to find if an element is in a list without prior or limited knowledge of the list contents. Sorting is used to prepare the matrix and to find elements in between sparse matrices and sparse vectors. In custom architectures, sorting networks are used for routing elements of the matrix and vector to the proper functional unit. Interestingly, The best sorting algorithm is a function of the distribution of elements. If you are stuck with a sorting algorithm and the wrong distribution, randomization may change the distribution, and you do not need to talk to any HW designer We organize our work as follows: In Section 2, we define the matrix by vector operation; in Section 3, we define what we mean for randomization. We use randomization to create a uniform distribution in Section 5 and we measure uniformity by nothing else than entropy in Section 4. We present how we drive our experiments to show the effects of randomization in Section 6. In the last sections we present a summary of the results: we present our work loads, benchmarks, in Section 7, and the complete set of measures for an AMD CPU and GPUs system in Section 8.

## 2 BASIC NOTATIONS

Let us start by describing the basic notations so we can clear the obvious (or not). A Sparse-matrix by vector multiplication SpMV on an (semi) ring based on the operations (+,\*) is defined as  $\mathbf{y} = \mathbb{M}\mathbf{x}$  so that  $y_i = \sum_j M_{i,j} * y_j$  where  $M_{i,j} = 0$  are not even represented and stored. Most of the experimental results in Section 8 are based on the classic addition (+) and multiplication (\*) in floating point precision using 64bits (i.e., double floating point precision). SpMV based on semi-ring (min,+) is a short path algorithm based on an adjacent matrix of a graph, and using a Boolean algebra we can check if two nodes are connected, which is slightly simpler.

We identify a sparse matrix  $\mathbb{M}$  of size  $M \times N$  as having O(M+N) non-zero elements, number of non zero nnz. Thus the complexity of  $\mathbb{M}\mathbf{x}$  is O(M+N)=2nnz. Of course, the definition of sparsity may vary. We represent the matrix  $\mathbb{M}$  by using the Coordinate COO or and the compressed sparse row  $CSR^1$  format. The COO represents the non-zero of a matrix by a triplet (i, j, val), very often there are three identical-in-size vectors for the ROW, COLUMN, and VALUE. The COO format takes  $3 \times nnz$  space and two consecutive elements in the value array are not bound to be neither in the same row nor column. In fact, we know only that  $VALUE[i] = M_{ROW}[i]$ .

The CSR stores elements in the same row and with increasing column values consecutively. There are three arrays V, COL, and ROW. The ROW is sorted in increasing order, its size is M, and ROW[i] is an index in V and COL describing where row-i starts (i.e., if row i exists). We have that  $M_{i,*}$  is stored in V[ROW[i]:ROW[i+1]] and the column are at COL[ROW[i]:ROW[i+1]] and sorted increasingly. The CSR takes  $2 \times nnz + M$  space and a row vector of the matrix can be found in O(1).

The computation as  $y_i = \sum_i M_{i,j} * x_j$  is a sequence of dot products and the CSR representation is a natural:

<sup>&</sup>lt;sup>1</sup>a.k.a. Compressed row storage CRS.

$$Index = ROW[i] : ROW[i+1]$$
 
$$y_i = \sum_{\ell \in Index} V[\ell] * x_{COL[\ell]}$$

The matrix row is contiguous (in memory) and contiguous rows are contiguous. The access of the (dense) vector  $\mathbf{x}$  could have no pattern. The COO format could use a little preparation: For example, we can sort the array by row and add row information to achieve the same properties of CSR; however transposing a COO matrix is just a swap of the array ROW and COL. Think about matrix multiply. As today, each dot product achieves peak performance if the reads of the vector  $\mathbf{x}$  are streamlined as much as possible and so the reads of the vector V. If we have multiple cores, each could compute a sub set of the  $y_i$  and a clean data load balancing can go a long way. If we have a few functional units, we would like to have a constant stream of independent \* and + operations but with data already in registers: that is, data pre-fetch will go a long way especially for  $x_{COL[i]}$ , which may have an irregular pattern.

### 78 3 RANDOMIZATION

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We refer to *Randomization* as row or column permutations of the matrix  $\mathbb{M}$  (thus a permutation of y and x) and we choose these by a pseudo-random process. Why we want to introduce uncertainty? The sparsity of our matrix  $\mathbb{M}$  has a pattern representing the nature of the original problem; such a pattern may exploit the wrong computation for an architecture; we could break such a pattern so that the only property left is a uniform distribution (of some sort). We must avoid the worst case and we would opt for an average case instead and we could do this to a class of  $\mathbb{M}$ .

If we know the matrix M and we know the architecture, preconditioning must be a better solution. Well, it is. If we run experiments long enough, we choose the best permutations for the architecture, permute M, and go on testing the next. On one end, preconditioning exerts a full understanding of both the matrix (the problem) and how the final solution will be computed (architecture). This is the culminating point of knowing and we must strive to it. On the other end, the simplicity of a random permutation requires no information about the matrix, the vector, and the architecture. Such a simplicity can be exploited directly in HW. We are after an understanding when randomization is just enough: we want to let the hardware do its best with the least effort, or at least with the appearance to be effortless. Also we shall show there are different flavors of random.

Interestingly, this work stems from a sincere surprise about randomization efficacy and its application on custom SpMV. Here, we want to study this problem systematically so that to help future hardware designs. Intuitively, if we can achieve a uniform distribution of the rows of matrix  $\mathbb{M}$  we can have provable expectation of its load balancing across multiple cores. If we have a uniform distribution of accesses on x we could exploit column load balancing and exploit better sorting algorithms: in practice the reading of  $x_{COL[i]}$  can be reduces to a sorting and we know that different sparsity may require different algorithms. This is a lot to unpack but this translates to a better performance of the sequential algorithm without changing the algorithm or better HW utilization.

We will show that (different) randomness affects architectures and algorithms differently, making randomization a suitable optimization especially when the application and hardware are at odds, hardware is difficult to change and the matrix sparsity is simple to change. We want to show that there is a randomness hierarchy that we can distinguish as global and local; there are simple-to-find cases where the sparsity breaks randomness and the matrix has to be split into components. We want to show that this study uses common tool, open software tools and sometimes naive experiments; however, we can infer properties applicable to proprietary and custom solutions.

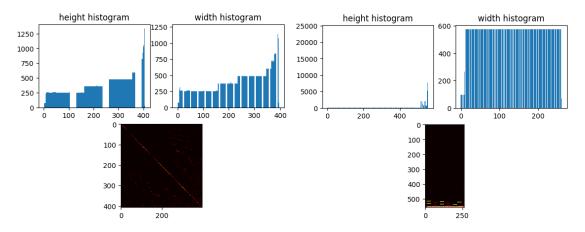


Fig. 1. Left: OPF 3754. Right: LP OSA 07. These are histograms where we represent normalized buckets and counts

# 4 ENTROPY

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Patterns in sparse matrices are often visually pleasing, see Figure 1 where we present the height histogram, the width histograms and a two-dimensional histogram as heat map. We will let someone else using AI picture classification. Intuitively, we would like to express a measure of uniform distribution and here we apply the basics: *Entropy*. Given an histogram  $i \in [0, M-1]$   $h_i \in \mathbb{N}$ , we define  $S = \sum_{i=0}^{M-1} h_i$  and thus we have a probability distribution function  $p_i = \frac{h_i}{S}$ . The *information* of bin i is defined as  $I(i) = -\log_2 p_i$ . If we say that the stochastic variable X has PDF  $p_i$  than the entropy of X is defined as.

$$H(x) = -\sum_{i=0}^{M-1} p_i \log_2 p_i = \sum_{i=0}^{M-1} p_i I(i) = E[I_x]$$
 (1)

The maximum entropy is when  $\forall i, p_i = p = \frac{1}{M}$ ; that is, we are observing a uniform distributed event. There is no conceptual difference when the PDF represents a two dimensional distribution. Thus our randomization should aim at higher entropy numbers. The entropy for matrix LP OSA 07 is 8.41 and for OPF 3754 is 8.39. We use the entropy specified in the Scipy stats module. A single number is concise and satisfying. If you are pondering why they are so close contrary to their sparsity we discuss this next.

#### 5 UNIFORM DISTRIBUTION

We know that we should **not** compare the entropy numbers of two matrices because entropy does not use any information about the order of the buckets only their probabilities. By construction, the matrices are quite different in sparsity and in shapes, however their entropy numbers are very close. Two matrices with the same number of non-zeros, spaced well enough in the proper number of bin, will have the same entropy. To appreciate their different sparsity, we should compare their entropy distributions by Jensen-Shannon measure (which is a symmetric measure, please do not use Kullback-Leibler KL divergence) [2]. Or we could use a representation of a hierarchical 2d-entropy, see Figure 2, where the entropy is split into 2x2, 4x4 and 8x8 (or fewer if the distribution is not square). We have a hierarchical entropy heat maps.

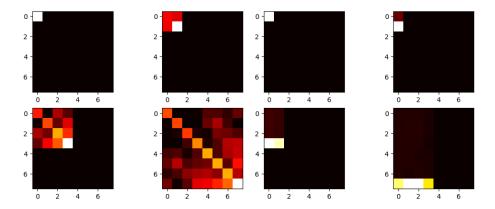


Fig. 2. Hierarchical 2D entropy for OPF 3754 (left) and LP OSA 07 (right).

We can see that a granular entropy summarizes better the nature of the matrix because it keep some spatial information. In this work, the entropy vector is used mostly for visualization purpose more than for comparison purpose. Of course, we can appreciate how the matrix LP OSA 07 has a few very heavy rows and they are clustered. This matrix will help us showing how randomization need some tips. Now we apply row and column random permutation once by row and one by column: Figure 3: OPF has now entropy 11.27 and LP 9.26. The numerical difference is significant. The good news is that for entropy, being an expectation, we can use simple techniques like bootstrap to show that the difference is significant or we have shown that Jensen-Shannon can be used and a significance level is available. What we like to see is the the hierarchical entropy heat map is becoming *more* uniform for at least one of the matrix.

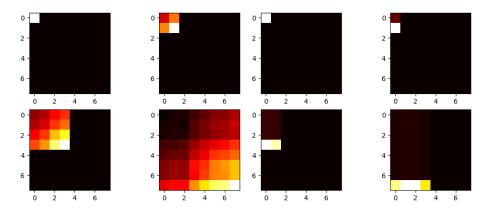


Fig. 3. Hierarchical 2D entropy after row and column random permutation for OPF 3754 (left) and LP OSA 07 (right).

In practice, permutations need some help especially for relatively large matrices. As you can see, the permutation affects locally the matrix. Of course, it depends on the implementation of the random permutation (we use numpy for this) but it is reasonable a slightly modified version of the original is still a random selection but unfortunately they seem more likely than they should. We need to compensate or help the randomization so that this current implementation does not get too lazy.

If we are able to identify the row and column that divide high and low density, we could use them as pivot for a shuffle like in a quick-sort algorithm. We could apply a sorting algorithm but its complexity will the same of SpMV. We use a gradients operations to choose the element with maximum steepness, Figure 4 and 5

LP achieves entropy 8.67 and 9.58 and OPF achieves 10.47 and 11.40.

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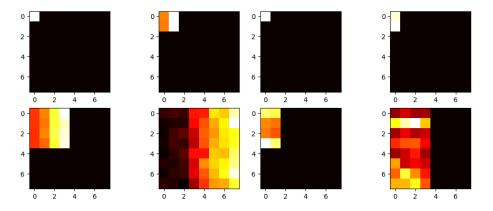


Fig. 4. Hierarchical 2D entropy after height gradient based shuffle and row random permutation for OPF 3754 (left) and LP OSA 07 (right).

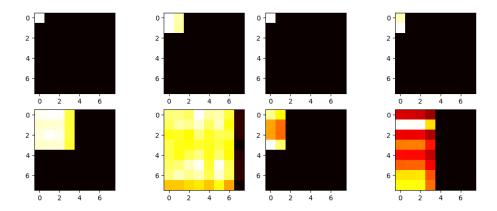


Fig. 5. Hierarchical 2D entropy after height and width gradient shuffle and row and column random permutation for OPF 3754 (left) and LP OSA 07 (right).

If the goal is to achieve a uniformly sparse matrix, it seems that we have the tools to compute and to measure such a sparsity. We admit that we do not try to find the best permutation. But our real goal is to create a work bench where randomization can be tested on different architectures and different algorithms. A randomization with a measurable uniform distribution is preferable than just random. We are interested to find out when random is enough or not enough. Also, consider that to achieve a uniform distribution, we do not need a random transformation and any permutation balancing the number of non-zero is possible, but for now not looked for.

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### **6 MEASURING THE RANDOMIZATION EFFECTS**

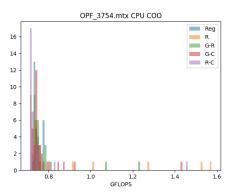
Whether or not this ever applied to the reader, when we have timed algorithms (i.e., measure execution time), we came to expect variation. The introduction of randomization may hide behind the ever present variance, after all these are algorithms on *small* inputs and small error can be comparable to the overall execution time. Here, we must address this concern even before describing the experiments.

First, we execute every algorithm between 1000 and 5000 times. The time of each experiment is in the seconds, providing a granularity for which we are confident the measuring time error is under control. Thus, for each experiment we provide an average execution time: we measure the time and we divide by the number of trials. Cold starts, the first iteration, are still accounted. To make the measure portable across platform we present GFLOPS, that is, Giga ( $10^{12}$ ) floating operations per second: 2\*nnz divided by the average time in seconds.

Then we repeat the same experiment 32 times. Permutations in *numpy* Python uses a seed that is time sensitive: thus every experiment is independent from the previous. The number 32 is an old statistic trick and it is a minimum number of independent trials to approximate a normal distribution. In practice, they are not but the number is sufficient for most of the cases and it is an excellent starting point.

A short hand legend: **Reg** is the matrix without any permutation and thus is the regular; **R** stands for random Row permutation; **G-R** stands for gradient-based row shuffle and random row permutation; **G-C** stands for gradient-based column shuffle and random column permutation; **R-C** stands for random row and column permutation. This legend is used in the pictures to be concise, in the tables in the following sections, we use a verbose description. We shall clarify the gradient based approach in the experimental results section 8. Intuitively, we help the random permutation by a quick targeting of high and low volume of the histogram (and thus the matrix).

In Figure 6, We show CPU performance using COO and CSR SpMV algorithms for the matrix OPF 3754. We can see that the CSR algorithms are consistent and the Regular (i.e., the original) has always the best performance. For the COO, permutations introduce long tails, thus performance advantage.



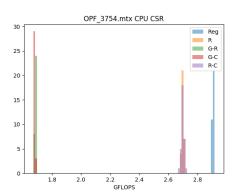


Fig. 6. CPU COO (left) and CPU CSR (left) for OPF 3754

In Figure 7, 8 and 9, randomization is harmful to the GPU implementation. The OPF 375 matrix is mostly diagonal, thus the vector  $\mathbf{x}$  is read in close quarters, randomization breaks it. If the load balance is fixed (i.e., by dividing the matrix by row and in equal row), randomization is beneficial.

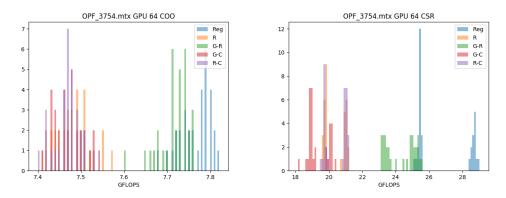


Fig. 7. Vega 20, GPU 64bits COO (left) and GPU CSR (right) for OPF 3754

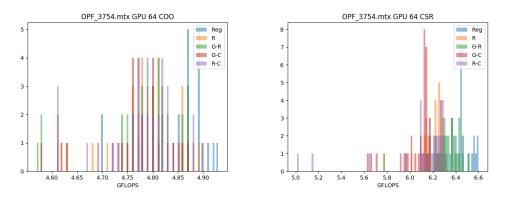


Fig. 8. Ellesmere, GPU 64bits COO (left) and GPU CSR (right) for OPF 3754

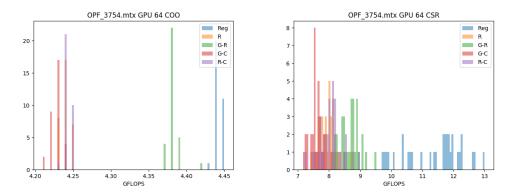


Fig. 9. Fiji, GPU 64bits COO (left) and GPU CSR (right) for OPF 3754

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If we take the original matrix and split into part having the same number of rows, and execute them in parallel using different cores, we can see in Figure 10 that randomization is quite useful.

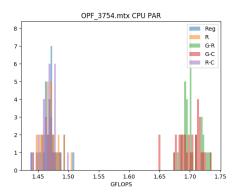


Fig. 10. Parallel CPU CSR for OPF 3754

For matrix LP OSA 07, randomization helps clearly only for CPU CSR as we show in Figure 11

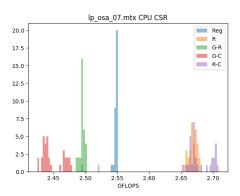


Fig. 11. CPU CSR for LP OSA 07

In Figure 12, 13, and 14, we can see that randomization is harmful but for one GPU, we can show that a single exception is possible (40% improvement).

An example, the matrix MULT DCOP 01, is where randomization is useful for the CPU, GPU, and the parallel version Figure 15, 16 - 19 and the gains can be up to 10-15%. Consider, we can achieve these improvements without any insights to the architecture, the algorithms and their relationships.

What does it mean when randomization does not work? The matrices we use in this work are not chosen randomly (pun not intended), they are the matrices that are difficult to handle in our custom SpMV engines using a combination of sorting networks and systolic arrays. If randomization does not work in our simplified work bench, will not work in our specialized architecture because the reorganization of the matrix or the input and output vector does not have the necessary parallelism, data locality, and data streaming. We need to do something else. In this case disrupting the memory pattern is not sufficient. Thus, if we cannot beat the pattern, we must exploit it, well not in this work.

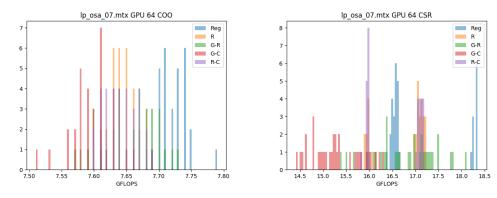


Fig. 12. Vega 20, GPU 64bits COO (left) and GPU CSR (right) for OPF 3754

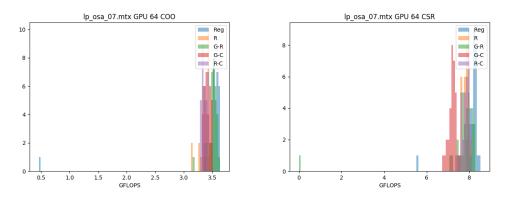


Fig. 13. Ellesmere, GPU 64bits COO (left) and GPU CSR (right) for OPF 3754

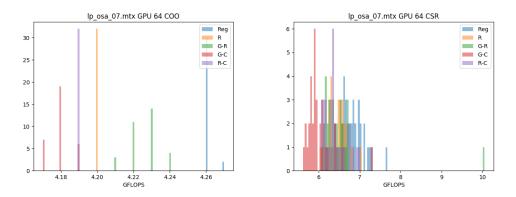


Fig. 14. Fiji, GPU 64bits COO (left) and GPU CSR (right) for OPF 3754

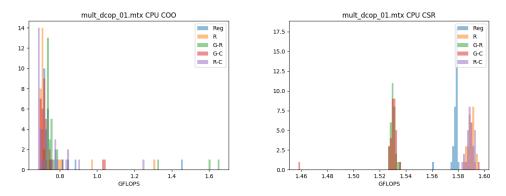


Fig. 15. CPU COO (left) and CPU CSR (right) for MULT DCOP 01

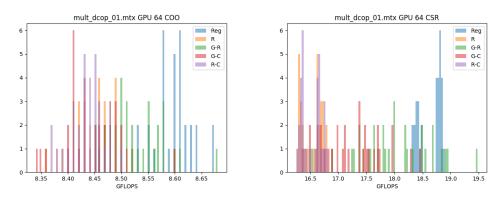


Fig. 16. Vega 20, GPU 64bits COO (left) and GPU CSR (right) for MULT DCOP 01

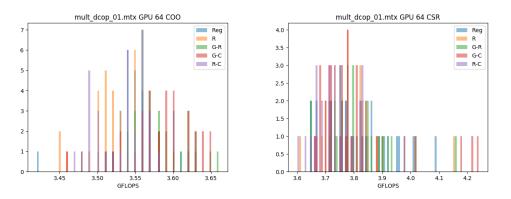
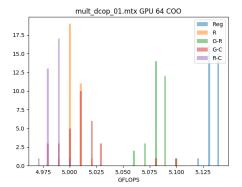


Fig. 17. Ellesmere, GPU 64bits COO (left) and GPU CSR (right) for MULT DCOP 01



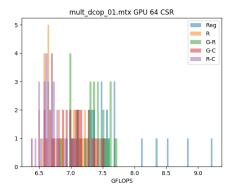


Fig. 18. Fiji, GPU 64bits COO (left) and GPU CSR (right) for MULT DCOP 01

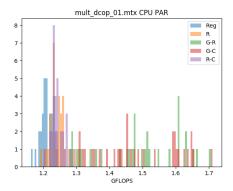


Fig. 19. Parallel CPU CSR for MULT DCOP 01

# 7 WORKLOADS

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In the previous sections, we defined what we mean for randomization and we present our tools of tricks for the measure of the effects of randomization. Here we describe the work loads, the applications, we use to test the effects of the randomization.

# 7.1 Python COO and CSR algorithms

The simplicity to compute the SpMV by the code z = A \* b in Python is very rewarding. By change of the matrix storage format, A = A.tocsr(); z = A \* b, we have a different algorithm. The performance exploitation is moved to the lower level. The CSR implementation is often two times faster but there are edge cases where the COO and COO with randomization can go beyond and be surprisingly better: MUL DCOP 03 is an example where COO can do well.

Intuitively, Randomization can affect the performance because the basic implementation is a sorting algorithm and it is a fixed algorithm. There are many sorting algorithms and each can be optimal for a different initial distribution. If we knew what is the sorting algorithm we could tailor the input distribution. Here we just play with it.

In Section 8, we present all the results for CPU and GPUS. Keep in mind that these problems are hard, in the sense they do not have fancy performance sheets (these architectures can achieve Tera FLOPs sustained performance for dense computations). If we go through diligently, we can see that there is a 15x performance difference between the single thread CPU and Vega 20 GPU (i.e, 3 vs 40 GFLOPS).

## 7.2 Parallel CSR using up to 16 cores

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Python provides the concept of Pool to exploit a naive parallel computation. We notice that work given to a Pool is split accordingly to the number of elements to separate HW cores. We also noticed that the work load move from a core to another, thus not ideal. Also we notice that Pool introduce a noticeable overhead: a Pool of 1, never achieves the performance of the single thread z = A \* b. Using Pool allows us to investigate how a naive row partitioning without counting can scale up with number of cores. We tested by splitting the rows to 1–16 cores evenly (one thread per core) and we present the performance for only the best configuration. The randomization goal is to distribute the work uniformly: a balanced work distribution avoid the unfortunate case where a single core does all the work. We are pleased by the simplicity of the benchmark and we know we can do better.

# 214 7.3 GPU COO and CSR algorithms

In this work, we use AMD GPUs and *rocSPARSE* is their current software. The software has a few glitches but overall can be used for different generation of AMD GPUs. We use the COO and CSR algorithms and we provide performance measure for double precision only. The ideas of using different GPUs: it is important to verify that the randomization can be applied independently of the HW. We are not here to compare performance across GPUs and CPUs. Often the limitation is the software, how the software can exploit the hardware or how the software will make easy to use a specific GPU. For example, the Fiji architecture is clearly superior to the Ellesmere, however the latter have better support and the system overall is more stable and user friendly.

The performance of the CSR algorithm is about two times faster than the COO. Most of the algorithms count the number of sparse elements in a row and thus they can decide the work load partition accordingly. Counting give you an edge but without changing the order of the computation there could be cases where the work load is not balanced and a little randomization could help and it does.

## 226 7.4 Randomization sometimes works

For the majority of the cases we investigated and reported in the following sections, Randomization does not work.

However, there are cases where randomization does work and does work for different algorithms and architectures. If

you are in the business of preconditioning, permutations are pretty cheap. If you can find a good one just consider like

a preconditioning matrix, which it is.

This shows also that HW has to be more conscious, well the HW designer should, and accept that there are options at software level, at matrix level and beyond.

#### 8 EXPERIMENTAL RESULTS

The main hardware setup is a AMD Threadripper with 16 cores. We have three Radeon GPUs: Vega 20 7nm, Pro 2xFiji, and Pro 2xEllesmere.

Vega 20 can deliver 3.5TFLOPS in double precision and it has 1TB/s HBM memory. Each Fiji provides 0.5 TFLOPS in double precision and has 512GB/s HBM, the card has two chips. The Ellesmere provides 0.3TFLOPS in double precision

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and has 224GB/s DDR5, the card has two chips. In the performance plots presented earlier and in the following, you will notice that the performance gap between these GPUs is not so marked. We can safely state that  $vega \sim 2 \times Fiji$  and  $Fiji \sim 2 \times ellesmere$ 

There are 4 basic randomization formats:

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- Random Row Permutation, we take the original matrix and permute the rows.
- Random Row and Column Permutation, we take the original matrix and permute the rows and the columns.
- Gradient based row permutation, we compute the row histogram and we compute the gradient:  $h_{i+1} h_i$ . We find a single point where the gradient is maximum, this is the pivot for a shuffle like a magician would shuffle a deck of cards. Then we permute the two parts randomly.
- Gradient based row and column permutation, As above but also for the columns.

For large matrices (large number of columns and rows) a permutation tends to be a close variation of the original, still a random permutation. The gradient allows us to describe two area of the original matrix where there is a clear and de-marked density variation: for example, there are two uniform distributed sub matrices but one denser than the other. A shuffle redistribute every other sample/card to different parts and these can be permuted locally.

We report in the following the performance results, we introduce a \* following the best performance. This is tedious to read and, we assure, to write. The code and the results are available as software repository.

254	9 VEGA VII A	AND THREADRIPPER	327	mult_dcop_02.mtx	
255	mult_dcop_03.mtx		328	Regular	
256	Regular		329		CPU COO min 1.615 max* 1.677 mean 1.652
257		CPU COO min 0.728 max 0.880 mean 0.757	330		CPU CSR min 1.539 max 1.579 mean 1.575
258		CPU CSR min 1.563 max 1.581 mean 1.577	331		GPU 64 COO min 8.530 max* 8.700 mean 8.614
259		GPU 64 COO min 8.540 max* 8.670 mean 8.619	332		CSR min 18.290 max 18.890 mean 18.597
260		CSR min 18.320 max 18.930 mean 18.620	333		CPU PAR min 1.120 max 1.248 mean 1.211
261		CPU PAR min 1.170 max 1.269 mean 1.226	334		H min 9.689 max 9.689 mean 9.689
262		H min 9.689 max 9.689 mean 9.689	335	Row-Premute	
263	Row-Premute		336		CPU COO min 0.684 max 0.780 mean 0.705
264		CPU COO min 0.710 max 0.845 mean 0.724	337		CPU CSR min 1.558 max* 1.596 mean 1.588
265		CPU CSR min 1.549 max* 1.597 mean 1.589	338		GPU 64 COO min 8.360 max 8.490 mean 8.433
266		GPU 64 COO min 8.360 max 8.540 mean 8.442	339		CSR min 16.240 max 16.750 mean 16.552
267		CSR min 16.260 max 16.780 mean 16.551	340		CPU PAR min 1.182 max 1.277 mean 1.242
268		CPU PAR min 1.205 max 1.319 mean 1.263	341		H min 10.737 max 10.742 mean 10.740
269		H min 10.737 max 10.742 mean 10.740	342	Row-Gradient	
270	Row-Gradient		343		CPU COO min 0.704 max 1.373 mean 0.790
271		CPU COO min 0.706 max 1.603 mean 0.806	344		CPU CSR min 1.518 max 1.535 mean 1.529
272		CPU CSR min 1.493 max 1.534 mean 1.528	345		GPU 64 COO min 8.420 max 8.590 mean 8.517
273		GPU 64 COO min 8.430 max 8.610 mean 8.527	346		CSR min 16.680 max*19.550 mean 17.907
274		CSR min 17.070 max*18.970 mean 18.115	347		CPU PAR min 1.328 max* 1.713 mean 1.484
275		CPU PAR min 1.331 max 1.695 mean 1.513	348		H min 10.572 max 10.585 mean 10.581
276		H min 10.576 max 10.585 mean 10.580	349	Column-Gradient	
277	Column-Gradient		350		CPU COO min 0.697 max 1.460 mean 0.742
278		CPU COO min 0.694 max* 1.632 mean 0.797	351		CPU CSR min 1.517 max 1.534 mean 1.527
279		CPU CSR min 1.491 max 1.534 mean 1.529	352		GPU 64 COO min 8.330 max 8.490 mean 8.420
280		GPU 64 COO min 8.350 max 8.520 mean 8.429	353		CSR min 16.020 max 18.390 mean 17.303
281		CSR min 15.970 max 18.180 mean 17.124	354		CPU PAR min 1.321 max 1.709 mean 1.557
282		CPU PAR min 1.321 max* 1.728 mean 1.514	355		H min 10.823 max*10.843 mean 10.835
283		H min 10.826 max*10.840 mean 10.833	356	Row-Column-Permute	
284	Row-Column-Permute		357		CPU COO min 0.691 max 0.746 mean 0.698
285		CPU COO min 0.688 max 0.757 mean 0.696	358		CPU CSR min 1.568 max 1.595 mean 1.587
286		CPU CSR min 1.490 max 1.595 mean 1.584	359		GPU 64 COO min 8.350 max 8.500 mean 8.436
287		GPU 64 COO min 8.380 max 8.500 mean 8.445	360		CSR min 16.250 max 16.780 mean 16.517
288		CSR min 16.230 max 16.780 mean 16.513	361		CPU PAR min 1.187 max 1.280 mean 1.228
289		CPU PAR min 1.192 max 1.274 mean 1.237	362		H min 10.739 max 10.743 mean 10.740
290		H min 10.737 max 10.742 mean 10.740	363	lp_fit2d.mtx	
291	mult_dcop_01.mtx		364	Regular	
292	Regular		365		CPU COO min 0.774 max 0.804 mean 0.793
293		CPU COO min 0.710 max 1.453 mean 0.761	366		CPU CSR min 2.538 max 2.550 mean 2.547
294		CPU CSR min 1.561 max 1.581 mean 1.578	367		GPU 64 COO min 7.060 max 7.170 mean 7.101
295		GPU 64 COO min 8.520 max 8.670 mean 8.597	368		CSR min 15.650 max*18.700 mean 18.031
296		CSR min 18.320 max 18.870 mean 18.636	369		CPU PAR min 1.537 max 1.645 mean 1.590
297		CPU PAR min 1.163 max 1.246 mean 1.212	370		H min 11.109 max 11.109 mean 11.109
298		H min 9.689 max 9.689 mean 9.689	371	Row-Premute	
299	Row-Premute		372		CPU COO min 0.740 max 0.776 mean 0.746
300		CPU COO min 0.699 max 1.305 mean 0.745	373		CPU CSR min 3.302 max* 3.328 mean 3.317
301		CPU CSR min 1.585 max 1.597 mean 1.590	374		GPU 64 COO min 7.040 max* 7.180 mean 7.098 CSR min 15.690 max 18.580 mean 16.732
302		GPU 64 COO min 8.360 max 8.520 mean 8.446	375		
303		CSR min 16.260 max 16.780 mean 16.528	376		CPU PAR min 1.327 max 1.482 mean 1.422 H min 11.098 max 11.105 mean 11.101
304		CPU PAR min 1.192 max 1.298 mean 1.242	377	Daw Candiant	n min 11.098 max 11.105 mean 11.101
305		H min 10.738 max 10.742 mean 10.740	378 379	Row-Gradient	CPU COO min 0.739 max* 2.092 mean 1.091
306	Row-Gradient		380		CPU CSR min 2.539 max 2.546 mean 2.543
307		CPU COO min 0.709 max* 1.656 mean 0.819			GPU 64 COO min 7.040 max 7.150 mean 7.100
308		CPU CSR min 1.527 max 1.535 mean 1.530	381 382		CSR min 15.520 max 18.560 mean 17.547
309		GPU 64 COO min 8.450 max* 8.680 mean 8.527	383		CPU PAR min 1.401 max 1.661 mean 1.525
310		CSR min 16.520 max*19.480 mean 17.984	384		H min 11.109 max 11.109 mean 11.109
311		CPU PAR min 1.280 max 1.704 mean 1.485	385	Column-Gradient	II IIIII II.103 IIIAX II.103 IIIEAII II.103
312		H min 10.572 max 10.585 mean 10.581	386	COTUMIN-OF AUTERIC	CPU COO min 0.726 max 2.065 mean 1.011
313	Column-Gradient				CPU COO min 0.726 max 2.065 mean 1.011 CPU CSR min 2.539 max 2.550 mean 2.546
314		CPU COO min 0.698 max 1.042 mean 0.737	387 388		GPU 64 COO min 6.800 max 7.140 mean 7.080
315		CPU CSR min 1.458 max 1.536 mean 1.528	389		CSR min 15.480 max 18.560 mean 16.866
316		GPU 64 COO min 8.340 max 8.600 mean 8.443	390		CPU PAR min 1.391 max* 1.737 mean 1.563
317		CSR min 16.360 max 18.450 mean 17.247	390		CPU PAR min 1.391 max* 1.737 mean 1.563 H min 11.329 max 11.333 mean 11.331
318		CPU PAR min 1.307 max* 1.712 mean 1.494	391	Row-Column-Permute	mii 11.323 max 11.333 medii 11.331
319		H min 10.823 max*10.841 mean 10.835	392	NOW-COTOMINE LEL MOTE	CPU COO min 0.746 max 0.782 mean 0.754
320	Row-Column-Permute		393		CPU COU min 0.746 max 0.782 mean 0.754  CPU CSR min 3.310 max 3.324 mean 3.318
321		CPU COO min 0.683 max 1.247 mean 0.749	394		GPU 64 COO min 7.030 max 7.160 mean 7.100
322		CPU CSR min 1.583 max* 1.595 mean 1.590			CSR min 15.730 max 18.530 mean 17.362
323		GPU 64 COO min 8.370 max 8.500 mean 8.435	396 397		CSW min 15.730 max 18.530 mean 17.362  CPU PAR min 1.340 max 1.451 mean 1.401
324		CSR min 16.250 max 16.780 mean 16.518	397 398		CPU PAR min 1.340 max 1.451 mean 1.401 H min 11.099 max 11.104 mean 11.102
325		CPU PAR min 1.206 max 1.291 mean 1.243	398	bloweya.mtx	miii 11.055 Max 11.104 Mean 11.102
326		H min 10.738 max 10.742 mean 10.740	400	Regular	
				6	

401		CPU COO min 0.727 max* 1.815 mean 0.892	475	GPU 64 COO min 11.340 max*11.860 mean 11.441
402		CPU CSR min 2.867 max* 2.936 mean 2.917	476	CSR min 36.010 max*40.960 mean 38.048
403		GPU 64 COO min 0.000 max 0.000 mean 0.000	477	CPU PAR min 2.019 max 2.204 mean 2.130
404		CSR min 0.000 max 0.000 mean 0.000	478	H min 8.228 max 8.228 mean 8.228
405		CPU PAR min 1.680 max* 1.751 mean 1.719	479 Row-Premute	
406		H min 7.205 max 7.205 mean 7.205	480	CPU COO min 0.718 max 0.751 mean 0.732
407	Row-Premute		481	CPU CSR min 2.488 max 2.507 mean 2.498
408		CPU COO min 0.678 max 1.483 mean 0.746	482	GPU 64 COO min 10.810 max 11.090 mean 10.949
409		CPU CSR min 2.311 max 2.326 mean 2.320	483	CSR min 24.860 max 26.410 mean 25.527
410		GPU 64 COO min 6.840 max* 7.270 mean 6.930	484	CPU PAR min 1.978 max 2.290 mean 2.135
411		CSR min 15.650 max 16.800 mean 16.233	485	H min 11.836 max 11.840 mean 11.838
412				11 III 11.030 IIIAX 11.040 IIICAN 11.030
			486 Row-Gradient	CPU COO min 0.722 max 1.794 mean 0.769
413		H min 11.026 max 11.031 mean 11.029	487	
414	Row-Gradient		488	Cro Con milit E. 107 max E. 121 mcdil E. 110
415		CPU COO min 0.708 max 1.209 mean 0.779	489	GPU 64 COO min 11.210 max 11.480 mean 11.317
416		CPU CSR min 1.648 max 1.735 mean 1.709	490	CSR min 31.920 max 34.690 mean 33.246
417		GPU 64 COO min 6.920 max 7.080 mean 7.015	491	CPU PAR min 2.184 max* 2.302 mean 2.232
418		CSR min 16.950 max 19.500 mean 17.794	492	H min 10.742 max 10.757 mean 10.748
419		CPU PAR min 1.497 max 1.743 mean 1.608	493 Column-Gradient	
420		H min 10.298 max 10.304 mean 10.301	494	CPU COO min 0.720 max 0.916 mean 0.742
421	Column-Gradient		495	CPU CSR min 2.395 max 2.410 mean 2.402
422		CPU COO min 0.709 max 1.536 mean 0.817	496	GPU 64 COO min 10.840 max 11.070 mean 10.946
423		CPU CSR min 1.705 max 1.753 mean 1.735	497	CSR min 24.340 max 26.140 mean 25.393
424		GPU 64 COO min 6.800 max 7.120 mean 6.865	498	CPU PAR min 2.184 max 2.272 mean 2.223
425		CSR min 15.480 max*17.710 mean 16.470	499	H min 11.873 max 11.882 mean 11.878
426		CPU PAR min 1.446 max 1.718 mean 1.591	500 Row-Column-Permute	11 IIIII 11.073 IIIAX 11.002 IIIEAII 11.070
427		H min 10.880 max 10.886 mean 10.883	501	CPU COO min 0.707 max 0.748 mean 0.714
428	Row-Column-Permute		502	CPU CSR min 2.458 max 2.511 mean 2.506
429		CPU COO min 0.670 max 1.024 mean 0.706	503	GPU 64 COO min 10.880 max 11.070 mean 10.957
430		CPU CSR min 2.199 max 2.340 mean 2.326	504	CSR min 24.890 max 26.490 mean 25.642
431		GPU 64 COO min 6.880 max 6.980 mean 6.933	505	CPU PAR min 2.209 max 2.282 mean 2.240
432		CSR min 15.610 max 16.900 mean 16.227	506	H min 11.834 max*11.840 mean 11.838
433		CPU PAR min 1.598 max 1.668 mean 1.632	507 brainpc2.mtx	
434		H min 11.025 max*11.032 mean 11.029	508 Regular	
435	lp_osa_07.mtx		509	CPU COO min 0.732 max 0.751 mean 0.744
436	Regular		510	CPU CSR min 2.885 max* 2.916 mean 2.909
437	-	CPU COO min 0.715 max 1.798 mean 0.885	511	GPU 64 COO min 0.000 max 0.000 mean 0.000
438		CPU CSR min 2.495 max 2.551 mean 2.547	512	CSR min 0.000 max 0.000 mean 0.000
439		GPU 64 COO min 7.650 max* 7.790 mean 7.718	513	CPU PAR min 1.276 max 1.299 mean 1.286
440		CSR min 16.390 max*18.350 mean 17.093	514	H min 7.478 max 7.478 mean 7.478
				n IIIIn 7.476 IIIax 7.476 IIIean 7.476
441		CPU PAR min 0.963 max 1.012 mean 0.995	515 Row-Premute	
442		H min 8.412 max 8.412 mean 8.412	516	CPU COO min 0.727 max 0.855 mean 0.736
443	Row-Premute		517	CPU CSR min 2.385 max 2.411 mean 2.397
444		CPU COO min 0.720 max* 2.078 mean 1.104	518	GPU 64 COO min 8.120 max 8.410 mean 8.206
445		CPU CSR min 2.656 max* 2.679 mean 2.669	519	CSR min 18.670 max 19.960 mean 19.536
446		GPU 64 COO min 7.610 max 7.690 mean 7.647	520	CPU PAR min 1.293 max 1.340 mean 1.314
447		CSR min 15.910 max 17.210 mean 16.750	521	H min 9.809 max 9.813 mean 9.811
448		CPU PAR min 0.890 max 0.940 mean 0.918	522 Row-Gradient	
449		H min 9.255 max 9.258 mean 9.256	523	CPU COO min 0.696 max* 1.546 mean 0.785
450	Row-Gradient		524	CPU CSR min 1.361 max 1.420 mean 1.411
451		CPU COO min 0.725 max 2.078 mean 1.041	525	GPU 64 COO min 8.190 max* 8.550 mean 8.302
452		CPU CSR min 2.487 max 2.502 mean 2.495	526	CSR min 18.700 max*21.000 mean 19.890
453		GPU 64 COO min 7.570 max 7.730 mean 7.655	527	CPU PAR min 1.435 max 1.666 mean 1.549
454		CSR min 15.370 max 18.100 mean 16.803	528	H min 9.721 max 9.727 mean 9.723
455		CPU PAR min 1.435 max 1.796 mean 1.592	529 Column-Gradient	
456		H min 8.637 max 8.678 mean 8.672	530	CPU COO min 0.698 max 1.467 mean 0.746
457	Column-Gradient		531	CPU CSR min 1.377 max 1.423 mean 1.414
	COTUMNI-OF AUTERIC	CDU COO 0 724 1 000 1 000		
458		CPU COO min 0.724 max 1.990 mean 1.000	532	GPU 64 COO min 8.110 max 8.290 mean 8.187
459		CPU CSR min 2.425 max 2.477 mean 2.448	533	CSR min 18.090 max 20.190 mean 19.217
460		GPU 64 COO min 7.510 max 7.660 mean 7.596	534	CPU PAR min 1.345 max* 1.681 mean 1.518
461		CSR min 14.410 max 16.290 mean 15.267	535	H min 10.369 max*10.372 mean 10.370
462		CPU PAR min 1.238 max 1.774 mean 1.534	536 Row-Column-Permute	
463		H min 9.447 max* 9.603 mean 9.576	537	CPU COO min 0.698 max 1.390 mean 0.788
464	Row-Column-Permute		538	CPU CSR min 2.387 max 2.410 mean 2.399
465		CPU COO min 0.738 max 1.950 mean 1.071	539	GPU 64 COO min 8.120 max 8.260 mean 8.191
466		CPU CSR min 2.522 max 2.709 mean 2.675	540	CSR min 18.530 max 19.960 mean 19.307
467		GPU 64 COO min 7.600 max 7.690 mean 7.641	541	CPU PAR min 1.295 max 1.347 mean 1.319
468		CSR min 15.820 max 17.190 mean 16.572	542	H min 9.809 max 9.813 mean 9.811
469		CPU PAR min 0.891 max 0.944 mean 0.924	543 shermanACb.mtx	
470		H min 9.255 max 9.258 mean 9.256	544 Regular	
471	ex19.mtx	3.235 3.250 3.230	544 Regulai 545	CPU COO min 0.712 max 1.201 mean 0.756
	Regular			CPU CSR min 1.558 max 1.601 mean 1.596
472	исвата	CDU COO 0 722 1 027 1	546	GPU 64 COO min 7.080 max* 7.370 mean 7.184
473		CPU COO min 0.732 max* 1.837 mean 1.076	547	
474		CPU CSR min 2.563 max* 2.586 mean 2.577	548	CSR min 17.580 max*19.480 mean 18.770

549		CPU PAR min 1.286 max 1.511 mean 1.447	623 Row-Premute	
550		H min 8.600 max 8.600 mean 8.600	624	CPU COO min 0.724 max 1.100 mean 0.765
551	Row-Premute		625	CPU CSR min 2.581 max* 2.626 mean 2.609
552		CPU COO min 0.689 max 0.890 mean 0.704	626	GPU 64 COO min 7.170 max 7.340 mean 7.253
553		CPU CSR min 1.600 max 1.630 mean 1.618	627	CSR min 17.360 max 18.500 mean 18.014
554		GPU 64 COO min 7.000 max 7.180 mean 7.061	628	CPU PAR min 1.494 max* 1.607 mean 1.558
555		CSR min 15.760 max 17.240 mean 16.625	629	H min 10.043 max 10.047 mean 10.044
556		CPU PAR min 1.296 max 1.419 mean 1.365	630 Row-Gradient	
557		H min 10.376 max 10.380 mean 10.379	631	CPU COO min 0.716 max 1.701 mean 0.804
558	Row-Gradient		632	CPU CSR min 1.824 max 1.840 mean 1.832
559		CPU COO min 0.704 max 1.615 mean 0.806	633	GPU 64 COO min 7.220 max* 7.510 mean 7.303
560		CPU CSR min 1.355 max 1.370 mean 1.362	634	CSR min 17.540 max*20.710 mean 19.302
561		GPU 64 COO min 7.020 max 7.160 mean 7.083	635	CPU PAR min 1.384 max 1.593 mean 1.526
562		CSR min 0.000 max 16.290 mean 15.076	636	H min 9.681 max 9.706 mean 9.694
563		CPU PAR min 1.256 max 1.520 mean 1.405	637 Column-Gradient	
564		H min 9.915 max 9.925 mean 9.921	638	CPU COO min 0.711 max 1.029 mean 0.746
565	Column-Gradient		639	CPU CSR min 1.817 max 1.834 mean 1.827
566		CPU COO min 0.702 max* 1.626 mean 0.844	640	GPU 64 COO min 7.110 max 7.270 mean 7.193
567		CPU CSR min 1.327 max 1.374 mean 1.364	641	CSR min 16.530 max 18.590 mean 17.574
568		GPU 64 COO min 6.920 max 7.210 mean 7.030	642	CPU PAR min 1.390 max 1.574 mean 1.511
569		CSR min 0.000 max 15.260 mean 14.279	643	H min 10.612 max*10.659 mean 10.634
570		CPU PAR min 1.283 max* 1.531 mean 1.385	644 Row-Column-Permute	
571		H min 10.572 max 10.595 mean 10.590	645	CPU COO min 0.719 max 1.391 mean 0.756
572	Row-Column-Permute		646	CPU CSR min 2.546 max 2.625 mean 2.611
573		CPU COO min 0.707 max 1.532 mean 0.924	647	GPU 64 COO min 7.190 max 7.320 mean 7.248
574		CPU CSR min 1.606 max* 1.634 mean 1.624	648	CSR min 17.500 max 18.640 mean 18.040
575		GPU 64 COO min 6.970 max 7.110 mean 7.045	649	CPU PAR min 1.465 max 1.573 mean 1.533
576		CSR min 15.850 max 17.310 mean 16.783	650	H min 10.041 max 10.046 mean 10.044
577		CPU PAR min 1.286 max 1.406 mean 1.357	651 TSOPF_FS_b9_c6.mtx	
578		H min 10.377 max 10.382 mean 10.379	652 Regular	
579	cvxqp3.mtx		653	CPU COO min 0.705 max 0.734 mean 0.718
580	Regular		654	CPU CSR min 3.028 max* 3.052 mean 3.045
581		CPU COO min 0.697 max 0.720 mean 0.712	655	GPU 64 COO min 0.000 max 0.000 mean 0.000
582		CPU CSR min 2.624 max* 2.643 mean 2.638	656	CSR min 0.000 max 0.000 mean 0.000
583		GPU 64 COO min 6.060 max* 6.220 mean 6.121	657	CPU PAR min 1.528 max* 1.602 mean 1.568
584		CSR min 19.450 max*22.710 mean 21.277	658	H min 7.380 max 7.380 mean 7.380
585		CPU PAR min 1.733 max* 1.860 mean 1.804	659 Row-Premute	
586		H min 8.646 max 8.646 mean 8.646	660	CPU COO min 0.733 max 1.640 mean 0.777
587	Row-Premute		661	CPU CSR min 2.450 max 2.543 mean 2.525
588		CPU COO min 0.695 max* 1.577 mean 0.894	662	GPU 64 COO min 7.200 max 7.320 mean 7.268
589		CPU CSR min 2.452 max 2.471 mean 2.464	663	CSR min 17.420 max 18.540 mean 18.102
590		GPU 64 COO min 5.870 max 6.060 mean 5.930	664	CPU PAR min 1.474 max 1.595 mean 1.546
591		CSR min 17.510 max 19.130 mean 18.516	665	H min 10.042 max 10.046 mean 10.044
592		CPU PAR min 1.723 max 1.833 mean 1.774	666 Row-Gradient	
593		H min 11.028 max 11.033 mean 11.030	667	CPU COO min 0.712 max 0.926 mean 0.750
594	Row-Gradient		668	CPU CSR min 1.819 max 1.846 mean 1.832
595		CPU COO min 0.693 max 1.523 mean 0.788	669	GPU 64 COO min 7.210 max* 7.370 mean 7.298
596		CPU CSR min 1.287 max 1.305 mean 1.296	670	CSR min 17.550 max*20.740 mean 19.089
597		GPU 64 COO min 5.920 max 6.000 mean 5.962	671	CPU PAR min 1.256 max 1.554 mean 1.495
598		CSR min 16.810 max 18.410 mean 17.561	672	H min 9.666 max 9.704 mean 9.690
599		CPU PAR min 1.378 max 1.485 mean 1.429	673 Column-Gradient	
600	Caluma Can II	H min 11.061 max 11.069 mean 11.064	674	CPU CO0 min 0.710 max* 1.690 mean 0.791
601	Column-Gradient	CPU COQ min 0.693 max 1.521 mean 0.772	675	CPU CSR min 1.813 max 1.836 mean 1.830
602			676	GPU 64 COO min 7.130 max 7.310 mean 7.211
603			677	CSR min 16.550 max 18.690 mean 17.617
604		GPU 64 COO min 5.900 max 6.060 mean 5.960	678	CPU PAR min 1.385 max 1.539 mean 1.506 H min 10.611 max*10.659 mean 10.634
605		CSR min 16.620 max 18.330 mean 17.592	679	H min 10.611 max*10.659 mean 10.634
606		CPU PAR min 1.372 max 1.464 mean 1.409	680 Row-Column-Permute	CPU COO 0 700 1 F31 0 0C3
607	David Callerina David	H min 11.127 max*11.135 mean 11.130	681	CPU COO min 0.709 max 1.531 mean 0.963
608	Row-Column-Permute	CDU COO	682	CPU CSR min 2.506 max 2.648 mean 2.622
609		CPU COO min 0.704 max 1.503 mean 0.875 CPU CSR min 2.447 max 2.468 mean 2.459	683 684	GPU 64 COO min 7.140 max 7.330 mean 7.244 CSR min 17.410 max 18.520 mean 18.148
610				CSR min 17.410 max 18.520 mean 18.148  CPU PAR min 1.466 max 1.574 mean 1.528
611		GPU 64 COO min 5.880 max 5.980 mean 5.931	685	CPU PAR min 1.466 max 1.574 mean 1.528 H min 10.041 max 10.046 mean 10.044
612		CSR min 17.550 max 19.140 mean 18.227  CPU PAR min 1.639 max 1.743 mean 1.704	686	וווווו וויש.שו max ואט.טו mean 10.044
613			687 OPF_6000.mtx	
614	0	H min 11.028 max 11.035 mean 11.030	688 Regular	CDII COO A 714 A 724 A 724
615	case9.mtx		689	CPU CO0 min 0.714 max 0.731 mean 0.720
616	Regular	CDU COO A 701 1 000 1 1	690	CPU CSR min 2.667 max* 2.770 mean 2.720
617		CPU CO0 min 0.721 max* 1.800 mean 1.177	691	GPU 64 COO min 12.310 max*12.550 mean 12.425
618 619		CPU CSR min 3.021 max* 3.046 mean 3.036	692	CSR min 39.860 max*43.770 mean 42.075
		GPU 64 COO min 0.000 max 0.000 mean 0.000	693	CPU PAR min 1.735 max 1.945 mean 1.845
		CCD -i- 0 000 0 000	(04	II -i- 0 700 0 700
620		CSR min 0.000 max 0.000 mean 0.000	694	H min 8.799 max 8.799 mean 8.799
		CSR min 0.000 max 0.000 mean 0.000  CPU PAR min 1.508 max 1.605 mean 1.573  H min 7.380 max 7.380 mean 7.380	694 695 Row-Premute 696	H min 8.799 max 8.799 mean 8.799  CPU COO min 0.689 max 0.710 mean 0.695

697		CPU CSR min 2.358 max 2.413 mean 2.392	771	CSR min 19.960 max 21.190 mean 20.696
698		GPU 64 COO min 11.430 max 11.770 mean 11.549	772	CPU PAR min 1.303 max 1.371 mean 1.345
699		CSR min 24.470 max 25.580 mean 24.785	773	H min 10.059 max 10.062 mean 10.061
700		CPU PAR min 1.758 max 1.896 mean 1.829	774 Row-Gradient	man release max release mean release
701		H min 11.872 max 11.877 mean 11.875	775	CPU COO min 0.723 max 0.984 mean 0.753
702	Row-Gradient		776	CPU CSR min 1.781 max 1.809 mean 1.803
703		CPU COO min 0.716 max 0.775 mean 0.739	777	GPU 64 COO min 9.380 max 9.660 mean 9.464
704		CPU CSR min 1.651 max 1.689 mean 1.675	778	CSR min 15.770 max 19.090 mean 18.037
705		GPU 64 COO min 12.100 max 12.410 mean 12.205	779	CPU PAR min 1.775 max* 1.924 mean 1.868
706		CSR min 31.670 max 34.910 mean 33.370	780	H min 10.205 max 10.233 mean 10.219
707		CPU PAR min 2.079 max* 2.286 mean 2.207	781 Column-Gradient	
708		H min 11.111 max 11.116 mean 11.113	782	CPU COO min 0.715 max 0.926 mean 0.757
709	Column-Gradient		783	CPU CSR min 1.729 max 1.802 mean 1.791
710		CPU COO min 0.715 max* 1.021 mean 0.743	784	GPU 64 COO min 9.080 max 9.270 mean 9.158
711		CPU CSR min 1.655 max 1.674 mean 1.666	785	CSR min 13.980 max 15.780 mean 14.938
712		GPU 64 COO min 11.340 max 11.560 mean 11.463	786	CPU PAR min 1.751 max 1.906 mean 1.846
713		CSR min 23.770 max 25.470 mean 24.489	787	H min 11.213 max*11.232 mean 11.222
714		CPU PAR min 2.056 max 2.172 mean 2.118	788 Row-Column-Permute	
715		H min 12.040 max*12.047 mean 12.043	789	CPU COO min 0.732 max 1.598 mean 0.785
716	Row-Column-Permute		790	CPU CSR min 2.594 max 2.602 mean 2.599
717		CPU COO min 0.677 max 0.785 mean 0.687	791	GPU 64 COO min 9.340 max 9.460 mean 9.394
718		CPU CSR min 2.325 max 2.434 mean 2.369	792	CSR min 19.950 max 21.500 mean 20.544
719		GPU 64 COO min 11.450 max 11.650 mean 11.538	793	CPU PAR min 1.326 max 1.374 mean 1.354
720		CSR min 24.330 max 25.560 mean 25.008	794	H min 10.059 max 10.062 mean 10.061
721		CPU PAR min 1.631 max 1.776 mean 1.709	795 mhd4800a.mtx	
722		H min 11.873 max 11.877 mean 11.875	796 Regular	
723	OPF_3754.mtx		797	CPU COO min 0.759 max 0.795 mean 0.780
724	Regular		798	CPU CSR min 2.479 max* 2.565 mean 2.557
725		CPU COO min 0.726 max 0.774 mean 0.747	799	GPU 64 COO min 5.490 max* 5.650 mean 5.552
726		CPU CSR min 2.898 max* 2.919 mean 2.908	800	CSR min 16.700 max 19.460 mean 18.004
727		GPU 64 COO min 7.680 max* 7.820 mean 7.766	801	CPU PAR min 1.456 max* 1.523 mean 1.492
728		CSR min 25.070 max*29.030 mean 26.756	802	H min 7.132 max 7.132 mean 7.132
729		CPU PAR min 1.437 max 1.508 mean 1.471	803 Row-Premute	
730		H min 8.393 max 8.393 mean 8.393	804	CPU COO min 0.695 max 0.943 mean 0.726
731	Row-Premute		805	CPU CSR min 2.480 max 2.488 mean 2.485
732		CPU COO min 0.714 max* 1.574 mean 0.817	806	GPU 64 COO min 5.410 max 5.490 mean 5.453
733		CPU CSR min 2.686 max 2.711 mean 2.699	807	CSR min 15.700 max 17.520 mean 16.678
734		GPU 64 COO min 7.410 max 7.570 mean 7.484	808	CPU PAR min 1.422 max 1.514 mean 1.474
735		CSR min 19.600 max 21.190 mean 20.307	809	H min 10.959 max 10.966 mean 10.963
736		CPU PAR min 1.443 max 1.505 mean 1.469	810 Row-Gradient	
737		H min 11.267 max 11.272 mean 11.269	811	CPU COO min 0.723 max* 2.029 mean 0.990
738	Row-Gradient		812	CPU CSR min 2.411 max 2.427 mean 2.421
739		CPU COO min 0.723 max 1.232 mean 0.775	813	GPU 64 COO min 5.490 max 5.560 mean 5.534
740		CPU CSR min 1.672 max 1.691 mean 1.685	814	CSR min 16.350 max*19.560 mean 17.784
741		GPU 64 COO min 7.600 max 7.760 mean 7.716	815	CPU PAR min 1.441 max 1.509 mean 1.477
742		CSR min 23.160 max 25.590 mean 24.304	816	H min 9.512 max 9.526 mean 9.520
743		CPU PAR min 1.675 max* 1.736 mean 1.703	817 Column-Gradient	
744		H min 10.463 max 10.472 mean 10.468	818	CPU COO min 0.721 max 1.802 mean 0.871
745	Column-Gradient		819	CPU CSR min 2.393 max 2.408 mean 2.404
746		CPU COO min 0.726 max 1.431 mean 0.778	820	GPU 64 COO min 5.410 max 5.480 mean 5.453
747		CPU CSR min 1.671 max 1.685 mean 1.679	821	CSR min 15.680 max 17.870 mean 16.540
748		GPU 64 COO min 7.410 max 7.530 mean 7.467	822	CPU PAR min 1.429 max 1.488 mean 1.468
749		CSR min 18.140 max 20.350 mean 19.315	823	H min 10.931 max 10.945 mean 10.938
750		CPU PAR min 1.650 max 1.736 mean 1.699	824 Row-Column-Permute	
751		H min 11.393 max*11.401 mean 11.397	825	CPU COO min 0.728 max 1.646 mean 1.037
752	Row-Column-Permute		826	CPU CSR min 2.472 max 2.488 mean 2.480
753		CPU COO min 0.711 max 1.458 mean 0.751	827	GPU 64 COO min 5.410 max 5.480 mean 5.449
754		CPU CSR min 2.678 max 2.717 mean 2.700	828	CSR min 15.760 max 17.560 mean 16.654
755		GPU 64 COO min 7.400 max 7.540 mean 7.471	829	CPU PAR min 1.428 max 1.513 mean 1.474
756		CSR min 19.560 max 21.150 mean 20.453	830	H min 10.959 max*10.967 mean 10.963
757		CPU PAR min 1.440 max 1.499 mean 1.467	831 gen4.mtx	
758		H min 11.266 max 11.272 mean 11.269	832 Regular	
759	c-47.mtx		833	CPU COO min 0.737 max 1.977 mean 1.431
760	Regular		834	CPU CSR min 2.674 max 2.688 mean 2.681
761		CPU COO min 0.754 max* 1.829 mean 1.204	835	GPU 64 COO min 5.900 max 6.000 mean 5.954
		CPU CSR min 2.610 max* 2.624 mean 2.618	836	CSR min 13.650 max 15.410 mean 14.657
762			837	CPU PAR min 1.468 max 1.521 mean 1.491
762 763		GPU 64 COO min 9.530 max* 9.870 mean 9.640		0.0 1741 HIZT 1.100 HBAX 1.021 HCGH 1.151
		GPU 64 COO min 9.530 max* 9.870 mean 9.640 CSR min 23.990 max*25.910 mean 24.992	838	H min 9.234 max 9.234 mean 9.234
763			838 839 Row-Premute	
763 764		CSR min 23.990 max*25.910 mean 24.992		
763 764 765	Row-Premute	CSR min 23.990 max*25.910 mean 24.992 CPU PAR min 1.311 max 1.380 mean 1.357	839 Row-Premute	H min 9.234 max 9.234 mean 9.234
763 764 765 766	Row-Premute	CSR min 23.990 max*25.910 mean 24.992 CPU PAR min 1.311 max 1.380 mean 1.357	839 Row-Premute 840	H min 9.234 max 9.234 mean 9.234  CPU COO min 0.740 max* 2.048 mean 1.121
763 764 765 766 767	Row-Premute	CSR min 23.990 max*25.910 mean 24.992 CPU PAR min 1.311 max 1.380 mean 1.357 H min 8.364 max 8.364 mean 8.364	839 Row-Premute 840 841	H min 9.234 max 9.234 mean 9.234  CPU COO min 0.740 max* 2.048 mean 1.121  CPU CSR min 2.777 max 2.798 mean 2.790
763 764 765 766 767 768	Row-Premute	CSR min 23.990 max*25.910 mean 24.992 CPU PAR min 1.311 max 1.380 mean 1.357 H min 8.364 max 8.364 mean 8.364 CPU COO min 0.740 max 0.885 mean 0.755	839 Row-Premute 840 841 842	H min 9.234 max 9.234 mean 9.234  CPU COO min 0.740 max* 2.048 mean 1.121  CPU CSR min 2.777 max 2.798 mean 2.790  GPU 64 COO min 5.910 max 5.970 mean 5.944

845		H min 10.250 max 10.255 mean 10.252	919	CPU COO min 0.735 max 1.806 mean 0.878
846	Row-Gradient		920	CPU CSR min 2.706 max 2.744 mean 2.726
847		CPU COO min 0.740 max 1.790 mean 0.994	921	GPU 64 COO min 6.390 max 6.500 mean 6.433
848		CPU CSR min 2.663 max 2.682 mean 2.674	922	CSR min 19.780 max 22.870 mean 20.936
849		GPU 64 COO min 5.890 max* 6.160 mean 5.946	923	CPU PAR min 1.710 max 1.865 mean 1.785
850		CSR min 13.780 max*17.520 mean 15.601	924	H min 10.251 max 10.267 mean 10.257
		CPU PAR min 1.479 max* 1.619 mean 1.569	925 Column-Gradient	11 IIII 10.231 IIIAX 10.207 IIICAN 10.237
851				
852		H min 9.939 max 9.955 mean 9.948	926	CPU COO min 0.728 max 1.792 mean 0.986
853	Column-Gradient		927	CPU CSR min 2.521 max 2.720 mean 2.703
854		CPU COO min 0.743 max 1.991 mean 0.981	928	GPU 64 COO min 6.280 max 6.370 mean 6.327
855		CPU CSR min 2.620 max 2.654 mean 2.646	929	CSR min 18.000 max 19.720 mean 19.040
856		GPU 64 COO min 5.840 max 5.910 mean 5.885	930	CPU PAR min 1.649 max 1.741 mean 1.702
857		CSR min 13.130 max 17.040 mean 15.008	931	H min 11.113 max 11.121 mean 11.117
				II IIIII II II III III III III II
858		CPU PAR min 1.477 max 1.607 mean 1.559	932 Row-Column-Permute	
859		H min 10.858 max*10.876 mean 10.864	933	CPU COO min 0.714 max 1.525 mean 0.957
860	Row-Column-Permute		934	CPU CSR min 2.876 max 2.892 mean 2.884
861		CPU COO min 0.742 max 2.010 mean 1.124	935	GPU 64 COO min 6.280 max 6.370 mean 6.322
862		CPU CSR min 2.789 max* 2.800 mean 2.795	936	CSR min 17.960 max 19.670 mean 18.670
863		GPU 64 COO min 5.900 max 5.980 mean 5.941	937	CPU PAR min 1.667 max 1.754 mean 1.710
864		CSR min 13.640 max 15.410 mean 14.556	938	H min 11.162 max*11.168 mean 11.165
865		CPU PAR min 1.462 max 1.540 mean 1.504	939 TSOPF_RS_b39_c7.mtx	
866		H min 10.250 max 10.253 mean 10.252	940 Regular	
867	Maragal_6.mtx		941	CPU COO min 0.771 max 0.793 mean 0.780
868	Regular		942	CPU CSR min 3.219 max* 3.232 mean 3.227
869	8	CPU COO min 0.725 max 0.741 mean 0.729	943	GPU 64 COO min 11.070 max*11.200 mean 11.142
870		CPU CSR min 2.345 max 2.409 mean 2.372	944	CSR min 37.050 max*42.100 mean 39.040
871		GPU 64 COO min 18.200 max 18.770 mean 18.357	945	CPU PAR min 1.910 max 2.027 mean 1.982
872		CSR min 38.310 max*40.240 mean 39.477	946	H min 7.304 max 7.304 mean 7.304
873		CPU PAR min 0.789 max 0.813 mean 0.797	947 Row-Premute	
874		H min 9.930 max 9.930 mean 9.930	948	CPU COO min 0.701 max 0.722 mean 0.707
875	Row-Premute	11 111 3.350 max 3.350 mean 3.350	949	CPU CSR min 2.931 max 2.952 mean 2.942
	ROW-Freiliute			
876		CPU COO min 0.709 max 0.779 mean 0.715	950	GPU 64 COO min 10.860 max 11.030 mean 10.928
877		CPU CSR min 2.675 max 2.715 mean 2.696	951	CSR min 28.730 max 30.880 mean 29.483
878		GPU 64 COO min 17.810 max 18.030 mean 17.935	952	CPU PAR min 1.760 max 1.922 mean 1.851
879		CSR min 29.650 max 30.580 mean 30.109	953	H min 10.537 max 10.541 mean 10.539
880		CPU PAR min 0.857 max 0.940 mean 0.904	954 Row-Gradient	
881		H min 10.777 max 10.779 mean 10.778	955	CPU COO min 0.747 max 0.808 mean 0.757
		11 IIII 10.777 IIIAX 10.775 IIIEAII 10.776		
882	Row-Gradient		956	CPU CSR min 2.606 max 2.648 mean 2.624
883		CPU COO min 0.710 max* 1.566 mean 0.755	957	GPU 64 COO min 10.850 max 11.120 mean 10.999
884		CPU CSR min 2.042 max 2.159 mean 2.120	958	CSR min 33.910 max 37.600 mean 35.909
885		GPU 64 COO min 18.460 max*18.960 mean 18.665	959	CPU PAR min 2.154 max* 2.245 mean 2.203
886		CSR min 25.650 max 27.330 mean 26.549	960	H min 9.636 max 9.646 mean 9.642
887		CPU PAR min 2.257 max 2.612 mean 2.416	961 Column-Gradient	11 111 3.000 max 3.010 mcan 3.012
888		H min 11.251 max 11.301 mean 11.285	962	CPU COO min 0.718 max* 1.693 mean 0.802
889	Column-Gradient		963	CPU CSR min 2.502 max 2.585 mean 2.547
890		CPU COO min 0.711 max 0.743 mean 0.725	964	GPU 64 COO min 10.700 max 10.990 mean 10.804
891		CPU CSR min 2.036 max 2.161 mean 2.110	965	CSR min 27.230 max 29.380 mean 28.488
892		GPU 64 COO min 17.840 max 18.860 mean 18.149	966	CPU PAR min 2.128 max 2.227 mean 2.172
893		CSR min 19.410 max 20.690 mean 20.066	967	H min 11.131 max*11.222 mean 11.208
				III III II. ISI IIIdx*II. 222 IIICdii III. 200
894		CPU PAR min 2.174 max* 2.546 mean 2.349	968 Row-Column-Permute	
895		H min 12.011 max*12.072 mean 12.052	969	CPU COO min 0.709 max 0.726 mean 0.716
896	Row-Column-Permute		970	CPU CSR min 2.917 max 2.958 mean 2.940
897		CPU COO min 0.712 max 0.971 mean 0.737	971	GPU 64 COO min 10.840 max 11.030 mean 10.930
898		CPU CSR min 2.732 max* 2.751 mean 2.743	972	CSR min 28.780 max 30.810 mean 29.578
899		GPU 64 COO min 17.720 max 18.070 mean 17.911	973	CPU PAR min 1.757 max 1.834 mean 1.792
		CSR min 29.600 max 30.500 mean 29.961		H min 10.537 max 10.540 mean 10.539
900			974	11 III III 10.557 IIIAX 10.540 IIIEAN 10.539
901		CPU PAR min 0.827 max 0.954 mean 0.913		
902		H min 10.776 max 10.778 mean 10.777		
903	aft01.mtx		10 FILECAA	CDC
904	Regular		975 10 ELLESM	LIXL
905		CPU COO min 0.735 max* 2.079 mean 1.069	976 aft01.mtx	
906		CPU CSR min 3.132 max* 3.154 mean 3.145		
			977 Regular	
907		GPU 64 COO min 6.390 max* 6.610 mean 6.457	978	GPU 64 COO min 4.080 max* 4.280 mean 4.186
908		CSR min 19.990 max*23.250 mean 21.820	979	CSR min 9.660 max*12.660 mean 11.485
909		CPU PAR min 1.746 max* 1.865 mean 1.812	980	H min 7.811 max 7.811 mean 7.811
910		H min 7.811 max 7.811 mean 7.811	981 Row-Premute	
911	Row-Premute		982	GPU 64 COO min 3.860 max 4.090 mean 4.001
912		CPU COO min 0.714 max 1.648 mean 0.840		
			983	CSR min 9.520 max 10.340 mean 9.936
913			984	H min 11.161 max 11.167 mean 11.165
914		GPU 64 COO min 6.280 max 6.380 mean 6.329	985 Row-Gradient	
915		CSR min 17.980 max 19.700 mean 19.105	986	GPU 64 COO min 4.010 max 4.240 mean 4.135
916		CPU PAR min 1.729 max 1.850 mean 1.782	987	CSR min 5.890 max 11.350 mean 6.882
917		H min 11.162 max 11.168 mean 11.165	988	
917 918	Row-Gradient	H min 11.162 max 11.168 mean 11.165	988 989 Column-Gradient	

000		CDU 64 COO min 2 050 mm. 4 100 mm. 4 012	1004	II 7 200 7 200 7 200
990		GPU 64 COO min 3.850 max 4.100 mean 4.012	1064	H min 7.380 max 7.380 mean 7.380
991		CSR min 5.460 max 8.790 mean 6.005	1065 Row-Premute	CDU 64 600 m/m 4 000 mm 4 040 mm 4 050
992		H min 11.112 max 11.122 mean 11.117	1066	GPU 64 COO min 4.820 max 4.940 mean 4.859
993	Row-Column-Permute		1067	CSR min 5.080 max 6.520 mean 6.342
994		GPU 64 COO min 3.850 max 4.080 mean 3.990	1068	H min 10.042 max 10.047 mean 10.044
995		CSR min 5.420 max 6.760 mean 5.977	1069 Row-Gradient	
996		H min 11.162 max*11.169 mean 11.165	1070	GPU 64 COO min 4.810 max* 4.940 mean 4.876
997	bloweya.mtx		1071	CSR min 6.100 max* 6.560 mean 6.307
998	Regular		1072	H min 9.681 max 9.704 mean 9.694
999		GPU 64 COO min 0.000 max 0.000 mean 0.000	1073 Column-Gradient	
1000		CSR min 0.000 max 0.000 mean 0.000	1074	GPU 64 COO min 4.810 max 4.930 mean 4.869
1001		H min 7.205 max 7.205 mean 7.205	1075	CSR min 4.820 max 6.460 mean 6.208
1002	Row-Premute		1076	H min 10.554 max*10.661 mean 10.638
1003		GPU 64 COO min 3.800 max 3.940 mean 3.875	1077 Row-Column-Permute	
1004		CSR min 3.710 max 4.570 mean 4.399	1078	GPU 64 COO min 4.810 max 4.940 mean 4.864
1005		H min 11.025 max 11.031 mean 11.028	1079	CSR min 5.930 max 6.520 mean 6.379
1006	Row-Gradient		1080	H min 10.041 max 10.047 mean 10.044
1007		GPU 64 COO min 3.800 max* 4.120 mean 3.962	1081 cvxqp3.mtx	
1008		CSR min 4.340 max* 4.670 mean 4.546	1082 Regular	
1009		H min 10.296 max 10.307 mean 10.300	1083	GPU 64 COO min 3.350 max* 3.590 mean 3.483
1010	Column-Gradient		1084	CSR min 5.430 max* 9.260 mean 8.333
1011		GPU 64 COO min 3.880 max 4.100 mean 3.978	1085	H min 8.646 max 8.646 mean 8.646
1012		CSR min 4.240 max 4.570 mean 4.412	1086 Row-Premute	
1013		H min 10.881 max 10.886 mean 10.883	1087	GPU 64 COO min 3.230 max 3.480 mean 3.371
1014	Row-Column-Permute	11 III 10.001 IIIAX 10.000 IIICAN 10.003	1088	CSR min 7.560 max 8.220 mean 7.900
1015	NOW-COTUMNI-FEI MULE	GPU 64 COO min 3.800 max 3.980 mean 3.885	1089	H min 11.027 max 11.033 mean 11.030
		CSR min 4.130 max 4.540 mean 4.399		n min 11.027 max 11.033 mean 11.030
1016			1090 Row-Gradient	
1017		H min 11.025 max*11.033 mean 11.029	1091	GPU 64 COO min 3.240 max 3.510 mean 3.396
1018	brainpc2.mtx		1092	CSR min 6.990 max 7.890 mean 7.574
1019	Regular		1093	H min 11.060 max 11.069 mean 11.064
1020		GPU 64 COO min 0.000 max 0.000 mean 0.000	1094 Column-Gradient	
1021		CSR min 0.000 max 0.000 mean 0.000	1095	GPU 64 COO min 3.240 max 3.480 mean 3.374
1022		H min 7.478 max 7.478 mean 7.478	1096	CSR min 6.980 max 7.900 mean 7.557
1023	Row-Premute		1097	H min 11.126 max*11.134 mean 11.130
1024		GPU 64 COO min 3.840 max* 6.750 mean 4.110	1098 Row-Column-Permute	
1025		CSR min 4.260 max* 4.500 mean 4.437	1099	GPU 64 COO min 3.110 max 3.470 mean 3.365
1026		H min 9.809 max 9.813 mean 9.811	1100	CSR min 4.810 max 8.210 mean 7.742
1027	Row-Gradient		1101	H min 11.026 max 11.032 mean 11.030
1028		GPU 64 COO min 0.640 max 4.030 mean 3.864	1102 ex19.mtx	
1029		CSR min 4.270 max 4.470 mean 4.383	1103 Regular	
1030		H min 9.722 max 9.727 mean 9.724	1104	GPU 64 COO min 2.450 max* 2.610 mean 2.564
1031	Column-Gradient		1105	CSR min 4.490 max 4.760 mean 4.714
1032		GPU 64 COO min 0.640 max 4.070 mean 3.898	1106	H min 8.228 max 8.228 mean 8.228
1033		CSR min 4.230 max 4.500 mean 4.386	1107 Row-Premute	
1034		H min 10.368 max*10.372 mean 10.370	1108	GPU 64 COO min 2.000 max 2.040 mean 2.021
1035	Row-Column-Permute		1109	CSR min 4.640 max 4.780 mean 4.733
1036		GPU 64 COO min 3.980 max 4.110 mean 4.027	1110	H min 11.835 max 11.840 mean 11.838
1037		CSR min 4.320 max 4.490 mean 4.437	1111 Row-Gradient	
1038		H min 9.809 max 9.813 mean 9.811	1112	GPU 64 COO min 2.240 max 2.390 mean 2.329
1039	c-47.mtx		1113	CSR min 4.570 max* 4.850 mean 4.807
1040	Regular		1114	H min 10.742 max 10.752 mean 10.747
1041	negazar	GPU 64 COO min 3.980 max* 4.080 mean 4.026	1115 Column-Gradient	man rolling max rolling mean rolling
1041		CSR min 4.760 max 4.850 mean 4.812	1116	GPU 64 COO min 2.010 max 2.050 mean 2.034
1043	Davi Daamut :	H min 8.364 max 8.364 mean 8.364	1117	CSR min 4.570 max 4.760 mean 4.701
1044	Row-Premute	CDU 64 000 m/m 2 000 mm 1 000	1118	H min 11.872 max*11.881 mean 11.878
1045		GPU 64 COO min 3.880 max 4.010 mean 3.942	1119 Row-Column-Permute	
1046		CSR min 4.040 max 4.900 mean 4.807	1120	GPU 64 COO min 2.000 max 2.040 mean 2.023
1047		H min 10.059 max 10.063 mean 10.061	1121	CSR min 0.770 max 4.780 mean 4.594
1048	Row-Gradient		1122	H min 11.835 max 11.840 mean 11.838
1049		GPU 64 COO min 3.900 max 4.050 mean 3.976	1123 gen4.mtx	
1050		CSR min 4.380 max 4.740 mean 4.630	1124 Regular	
1051		H min 10.201 max 10.228 mean 10.214	1125	GPU 64 COO min 4.880 max 4.980 mean 4.900
1052	Column-Gradient		1126	CSR min 10.020 max*11.300 mean 10.716
1053		GPU 64 COO min 3.860 max 3.990 mean 3.936	1127	H min 9.234 max 9.234 mean 9.234
1054		CSR min 4.350 max 4.610 mean 4.525	1128 Row-Premute	
1055		H min 11.204 max*11.241 mean 11.222	1129	GPU 64 COO min 4.860 max 4.930 mean 4.890
1056	Row-Column-Permute		1130	CSR min 0.330 max 11.200 mean 10.038
1057		GPU 64 COO min 3.890 max 4.020 mean 3.953	1131	H min 10.249 max 10.254 mean 10.252
1058		CSR min 4.490 max* 4.920 mean 4.840	1132 Row-Gradient	
1059		H min 10.058 max 10.063 mean 10.061	1133	GPU 64 COO min 4.860 max* 4.990 mean 4.908
1060	case9.mtx		1134	CSR min 9.160 max 11.240 mean 10.435
1061	Regular		1135	H min 9.939 max 9.961 mean 9.947
1062		GPU 64 COO min 0.000 max 0.000 mean 0.000	1136 Column-Gradient	MIN 3.333 MAX 3.301 Medit 3.347
1063		CSR min 0.000 max 0.000 mean 0.000	1137	GPU 64 COO min 4.780 max 4.880 mean 4.816
1000		55K mil. 5.555 mil. 6.666 mean 6.666		5. 555 mil. 1.755 max 4.550 mean 4.510

1138		CSR min 7.770 max 10.570 mean 9.407	1212 Row-Premute	
1139		H min 10.851 max*10.876 mean 10.864	1212 ROW-Premute 1213	GPU 64 COO min 4.420 max 4.520 mean 4.445
1140	Row-Column-Permute	11 IIII1 10.831 IIIAX*10.870 IIIEAN 10.804	1214	CSR min 10.520 max 10.880 mean 10.696
1141	NOW-COTUMIN-FET MALE	GPU 64 COO min 4.850 max 4.950 mean 4.886	1215	H min 10.960 max*10.968 mean 10.963
1142		CSR min 10.220 max 11.280 mean 10.748	1216 Row-Gradient	11 IIII 10.300 IIIAX^10.300 IIIEAN 10.303
1143		H min 10.250 max 10.255 mean 10.252	1217 ROW-GI addelic	GPU 64 COO min 4.570 max 4.690 mean 4.605
1144	lp_fit2d.mtx	11 III11 10.230 IIIAX 10.233 IIIEAII 10.232	1218	CSR min 4.550 max 13.350 mean 12.479
1145	Regular		1219	H min 9.508 max 9.527 mean 9.520
1146	Negutai	GPU 64 COO min 4.360 max* 4.640 mean 4.515	1220 Column-Gradient	11 1111 3.300 max 3.327 mean 3.320
1147		CSR min 10.080 max 10.900 mean 10.491	1221	GPU 64 COO min 4.430 max 4.530 mean 4.461
1148		H min 11.109 max 11.109 mean 11.109	1222	CSR min 10.250 max 10.940 mean 10.603
1149	Row-Premute	II IIII II.103 IIIAX II.103 IIIEAII II.103	1223	H min 10.934 max 10.945 mean 10.939
1150	NOW-F1 elliute	GPU 64 COO min 4.170 max 4.630 mean 4.476	1224 Row-Column-Permute	11 IIII 10.534 IIIAX 10.543 IIIEAN 10.535
1151		CSR min 0.910 max 10.910 mean 10.257	1225	GPU 64 COO min 4.420 max 4.520 mean 4.450
1152		H min 11.098 max 11.104 mean 11.101	1226	CSR min 7.380 max 10.900 mean 10.598
1153	Row-Gradient	11 IIII 11.030 IIIAX 11.104 IIIEAN 11.101	1227	H min 10.959 max 10.967 mean 10.963
1154	NOW-GI AUTEIIL	GPU 64 COO min 4.370 max 4.630 mean 4.529	1228 mult_dcop_01.mtx	11 IIII 10.535 IIIAX 10.507 IIIEAII 10.503
1155		CSR min 10.030 max 10.970 mean 10.624	1229 Regular	
1156		H min 11.109 max 11.109 mean 11.109	1239 Regulai 1230	GPU 64 COO min 3.420 max 3.630 mean 3.555
1157	Column-Gradient	II IIIII II.105 IIIAX II.105 IIIEAII II.105	1231	CSR min 3.650 max 4.090 mean 3.814
1158	COTUMIT-OF AUTERIC	GPU 64 COO min 4.250 max 4.640 mean 4.499	1232	H min 9.689 max 9.689 mean 9.689
1159		CSR min 8.510 max*11.010 mean 10.505	1233 Row-Premute	11 IIII1 5.005 IIIAX 5.005 IIIEAII 5.005
1160		H min 11.328 max*11.333 mean 11.331	1234	GPU 64 COO min 3.450 max 3.580 mean 3.521
1161	Row-Column-Permute	11 IIII 11.320 IIIAX*11.333 IIIEAII 11.331	1235	CSR min 3.610 max 4.150 mean 3.785
1162	NOW-COTUMIN-FET MALE	GPU 64 COO min 4.350 max 4.640 mean 4.511	1236	H min 10.738 max 10.742 mean 10.740
1163		CSR min 10.040 max 10.790 mean 10.468	1237 Row-Gradient	11 IIII1 10.730 IIIAX 10.742 IIIEAII 10.740
1164		H min 11.097 max 11.106 mean 11.101	1237 Row-Gradient	GPU 64 COO min 3.510 max* 3.660 mean 3.579
1165	lp_osa_07.mtx	n min 11.097 max 11.100 mean 11.101	1239	CSR min 3.650 max 4.160 mean 3.806
1166	Regular		1240	H min 10.576 max 10.585 mean 10.580
1167	кедитаг	GPU 64 COO min 0.460 max* 3.640 mean 3.456	1241 Column-Gradient	n IIIIn 10.576 IIIax 10.565 IIIean 10.560
1168		CSR min 5.570 max* 8.530 mean 8.106	1242 CO1umn=Grad1ent	GPU 64 COO min 3.460 max 3.650 mean 3.584
1169		H min 8.412 max 8.412 mean 8.412	1242	CSR min 3.660 max* 4.240 mean 3.799
1170	Row-Premute	n	1243	H min 10.826 max*10.842 mean 10.836
1170	Row-Preliute	GPU 64 COO min 3.140 max 3.450 mean 3.367	1244 1245 Row-Column-Permute	n
1171		CSR min 7.600 max 8.070 mean 7.853	1246 ROW-CO1UIIII-PERIIULE	GPU 64 COO min 3.470 max 3.580 mean 3.532
1173		H min 9.255 max 9.258 mean 9.256	1247	CSR min 3.600 max 3.980 mean 3.743
1173	Row-Gradient	n min 9.255 max 9.256 mean 9.256		H min 10.738 max 10.742 mean 10.740
	ROW-Gradient	GPU 64 COO min 3.190 max 3.610 mean 3.509	1248 1249 mult_dcop_02.mtx	n IIIIN 10.738 IIIAX 10.742 IIIEAN 10.740
1175		CSR min 0.000 max 8.260 mean 7.597		
1176 1177		H min 8.583 max 8.678 mean 8.670		GPU 64 COO min 3.390 max 3.660 mean 3.585
1177	Column-Gradient	n    11  8.383    4x 8.078    eal  8.070	1251	
	COTUMN-Gradient	CDU 64 COO min 2 220 mm. 2 E00 mm. 2 416	1252	CSR min 0.960 max 4.330 mean 4.162 H min 9.689 max 9.689 mean 9.689
1179		GPU 64 COO min 3.330 max 3.500 mean 3.416	1253 1254 Row-Premute	n IIII 9.069 IIIax 9.069 IIIean 9.089
1180		CSR min 6.730 max 7.540 mean 7.199		CDU 64 000/- 2 210 2 600 2 400
1181	D	H min 9.542 max* 9.604 mean 9.581	1255	GPU 64 COO min 3.310 max 3.600 mean 3.488
1182	Row-Column-Permute	CDU 64 000 min - 2 200 min - 2 420 min - 2 205	1256	CSR min 0.620 max 4.290 mean 4.132
1183		GPU 64 COO min 3.290 max 3.430 mean 3.365	1257	H min 10.738 max 10.743 mean 10.740
1184		CSR min 7.390 max 8.060 mean 7.832 H min 9.255 max 9.258 mean 9.256	1258 Row-Gradient	GPU 64 COO min 3.310 max* 3.670 mean 3.593
1185	Managal 6 mt.:	H min 9.255 max 9.258 mean 9.256	1259	CSR min 4.130 max* 4.430 mean 4.331
1186	Maragal_6.mtx		1260	H min 10.576 max 10.584 mean 10.580
1187	Regular	GPU 64 COO min 4.160 max 4.310 mean 4.217	1261	n IIII 10.576 IIIax 10.564 IIIean 10.560
1188 1189		CSR min 4.940 max 4.960 mean 4.956	1262 Column-Gradient 1263	GPU 64 COO min 0.550 max 3.660 mean 3.486
1190		H min 9.930 max 9.930 mean 9.930	1264	CSR min 3.890 max 4.410 mean 4.275
1191	Row-Premute	11 IIII1 5.530 IIIAX 5.530 IIIEAII 5.530	1265	H min 10.831 max +10.843 mean 10.836
	NOW-F1 elliute	GPU 64 COO min 4.220 max 4.240 mean 4.225		11 IIII 10.031 IIIAX^10.043 IIIEAI1 10.030
1192		CSR min 4.750 max*13.040 mean 5.133		GPU 64 COO min 3.470 max 3.590 mean 3.542
1193		H min 10.776 max 10.778 mean 10.777	1267	CSR min 4.190 max 4.290 mean 4.242
1194	Dani Candinat	n min 10.776 max 10.778 mean 10.777	1268	H min 10.738 max 10.742 mean 10.740
1195	Row-Gradient	CDU 64 COO min 4 100 mout 4 450 mon 4 245	1269 1270 mult_dcop_03.mtx	n IIIIN 10.738 IIIAX 10.742 IIIEAN 10.740
1196		GPU 64 COO min 4.180 max* 4.450 mean 4.245		
1197		CSR min 4.880 max 4.940 mean 4.915 H min 11.259 max*11.302 mean 11.281	1271 Regular	CDU 64 COO -i- 3 360 3 660 3 660
1198 1199	Column-Cradiont	H min 11.259 max*11.302 mean 11.281	1272	GPU 64 COO min 3.360 max* 3.660 mean 3.550
1200	Column-Gradient	GPU 64 COO min 4.200 max 4.250 mean 4.236	1273 1274	CSR min 3.650 max 4.090 mean 3.813 H min 9.689 max 9.689 mean 9.689
1200		CSR min 4.800 max 4.890 mean 4.859		mii 2.002 max 9.009 mean 9.689
1201		H min 12.022 max 12.073 mean 12.051	1275 Row-Premute	GPU 64 COO min 3.450 max 3.580 mean 3.521
	Row-Column-Permute	11 1111 12.022 111dX 12.073    Hedfi 12.051	1276	CSR min 3.610 max 4.160 mean 3.784
1203 1204	vow-corminates mare	GPU 64 COO min 4.210 max 4.230 mean 4.222	1277	H min 10.738 max 10.743 mean 10.740
			1278 1279 Row-Gradient	mean 10./40 מכו.שו וונווו נבוו מבו mean 10./40
1205 1206		CSR min 4.860 max 4.890 mean 4.887 H min 10.776 max 10.778 mean 10.778	1279 Row-Gradient 1280	CPII 64 COO min 2 470 2 660 2 572
	mbd49002 mt.:	וו ווווו וש.//ס max וש.//א mean וש.//א		GPU 64 COO min 3.470 max 3.660 mean 3.572
1207	mhd4800a.mtx		1281	CSR min 3.640 max 4.190 mean 3.809 H min 10.572 max 10.584 mean 10.580
1208	Regular	CDU 64 COO 4 F70 4 710 4 COO	1282 1283 Column-Gradient	H min 10.572 max 10.584 mean 10.580
1209		GPU 64 COO min 4.570 max* 4.710 mean 4.608		CDII 64 COO min 2 420 2 552 2 552
1210 1211		CSR min 12.690 max*13.940 mean 13.369 H min 7.132 max 7.132 mean 7.132	1284 1285	GPU 64 COO min 3.430 max 3.650 mean 3.562 CSR min 3.670 max* 4.290 mean 3.793

1286		H min 10.828 max*10.840 mean 10.834	1360	GPU 64 COO min 4.540 max 4.940 mean 4.874
1287	Row-Column-Permute		1361	CSR min 6.280 max 6.520 mean 6.403
1288		GPU 64 COO min 3.370 max 3.610 mean 3.502	1362	H min 10.042 max 10.047 mean 10.044
1289		CSR min 3.610 max 3.970 mean 3.744	1363 Row-Gradient	
1290		H min 10.738 max 10.741 mean 10.740	1364	GPU 64 COO min 4.830 max 4.930 mean 4.875
1291	OPF_3754.mtx		1365	CSR min 5.790 max* 6.560 mean 6.289
1292	Regular		1366	H min 9.675 max 9.706 mean 9.692
	Regular	GPU 64 COO min 4.700 max* 4.930 mean 4.842		n min 9.075 max 9.706 mean 9.092
1293			1367 Column-Gradient	
1294		CSR min 6.230 max* 6.600 mean 6.411	1368	GPU 64 COO min 4.790 max* 4.960 mean 4.880
1295		H min 8.393 max 8.393 mean 8.393	1369	CSR min 5.760 max 6.450 mean 6.204
1296	Row-Premute		1370	H min 10.601 max*10.661 mean 10.626
1297		GPU 64 COO min 4.620 max 4.890 mean 4.787	1371 Row-Column-Permute	
1298		CSR min 5.780 max 6.310 mean 6.192	1372	GPU 64 COO min 4.330 max 4.950 mean 4.845
1299		H min 11.265 max 11.272 mean 11.269	1373	CSR min 5.740 max 6.500 mean 6.375
1300	Row-Gradient		1374	H min 10.041 max 10.046 mean 10.044
1301	Now Gradient	GPU 64 COO min 4.570 max 4.870 mean 4.776	1375 TSOPF_RS_b39_c7.mtx	11 IIII 10.041 IIIAX 10.040 IIICAN 10.044
1302		CSR min 5.770 max 6.510 mean 6.302	1376 Regular	
1303		H min 10.464 max 10.473 mean 10.468	1377	GPU 64 COO min 4.300 max* 4.430 mean 4.364
1304	Column-Gradient		1378	CSR min 4.480 max 4.750 mean 4.716
1305		GPU 64 COO min 4.580 max 4.870 mean 4.756	1379	H min 7.304 max 7.304 mean 7.304
1306		CSR min 5.630 max 6.180 mean 6.055	1380 Row-Premute	
1307		H min 11.394 max*11.401 mean 11.397	1381	GPU 64 COO min 4.260 max 4.400 mean 4.353
1308	Row-Column-Permute		1382	CSR min 4.490 max 4.770 mean 4.734
1309	Now Column 1 Crimate	GPU 64 COO min 4.610 max 4.900 mean 4.780	1383	H min 10.536 max 10.541 mean 10.539
				11 IIII1 10.550 IIIAX 10.541 IIIEAII 10.555
1310		CSR min 5.010 max 6.300 mean 6.113	1384 Row-Gradient	
1311		H min 11.268 max 11.272 mean 11.270	1385	GPU 64 COO min 3.970 max 4.420 mean 4.338
1312	OPF_6000.mtx		1386	CSR min 4.620 max* 4.820 mean 4.789
1313	Regular		1387	H min 9.638 max 9.644 mean 9.641
1314		GPU 64 COO min 3.780 max* 3.920 mean 3.864	1388 Column-Gradient	
1315		CSR min 4.270 max 4.360 mean 4.332	1389	GPU 64 COO min 4.240 max 4.430 mean 4.368
1316		H min 8.799 max 8.799 mean 8.799	1390	CSR min 4.710 max 4.770 mean 4.736
1317	Row-Premute	11 111 0.735 max 0.735 mean 0.735	1391	H min 11.129 max*11.222 mean 11.205
	NOW-F1 elliute	GPU 64 COO min 3.770 max 3.870 mean 3.821		11 IIIII 11.125 IIIdX^11.222 IIIedii 11.203
1318			1392 Row-Column-Permute	
1319		CSR min 3.970 max*11.050 mean 4.439	1393	GPU 64 COO min 4.260 max 4.410 mean 4.359
1320		H min 11.872 max 11.877 mean 11.875	1394	CSR min 4.660 max 4.760 mean 4.738
1321	Row-Gradient		1395	H min 10.537 max 10.541 mean 10.539
1322		GPU 64 COO min 3.700 max 3.870 mean 3.795		
1323		CSR min 4.330 max 4.440 mean 4.403		
1324	Column-Gradient		1396 <b>11 FIJI</b>	
1324 1325	Column-Gradient	H min 11.109 max 11.116 mean 11.113	-	
1324 1325 1326	Column-Gradient	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx	
1324 1325 1326 1327	Column-Gradient	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804 CSR min 4.260 max 4.340 mean 4.308	-	
1324 1325 1326 1327 1328		H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx	GPU 64 COO min 5.140 max* 5.140 mean 5.140
1324 1325 1326 1327	Column-Gradient Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804 CSR min 4.260 max 4.340 mean 4.308	1397 mult_dcop_03.mtx 1398 Regular	GPU 64 COO min 5.140 max* 5.140 mean 5.140 CSR min 10.340 max*10.390 mean 10.365
1324 1325 1326 1327 1328		H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804 CSR min 4.260 max 4.340 mean 4.308	1397 mult_dcop_03.mtx 1398 Regular 1399	
1324 1325 1326 1327 1328 1329		H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804  CSR min 4.260 max 4.340 mean 4.308  H min 12.041 max*12.045 mean 12.043	1397 mult_dcop_03.mtx 1398 Regular 1399 1400	CSR min 10.340 max*10.390 mean 10.365
1324 1325 1326 1327 1328 1329 1330 1331		H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.884  CSR min 4.260 max 4.340 mean 4.308  H min 12.041 max*12.045 mean 12.043  GPU 64 COO min 3.780 max 3.860 mean 3.819  CSR min 4.090 max 4.290 mean 4.259	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689
1324 1325 1326 1327 1328 1329 1330 1331 1332	Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689 GPU 64 COO min 4.970 max 4.990 mean 4.980
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333	Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.884  CSR min 4.260 max 4.340 mean 4.308  H min 12.041 max*12.045 mean 12.043  GPU 64 COO min 3.780 max 3.860 mean 3.819  CSR min 4.090 max 4.290 mean 4.259	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333	Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689 GPU 64 COO min 4.970 max 4.990 mean 4.980
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334	Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335	Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 5.085
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334	Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335	Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 5.085
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336	Row-Column-Permute shermanACb.mtx Regular	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 5.085 CSR min 9.720 max 10.300 mean 10.010
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337	Row-Column-Permute shermanACb.mtx Regular	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 5.085 CSR min 9.720 max 10.300 mean 10.010
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338	Row-Column-Permute shermanACb.mtx Regular	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.080 max 5.120 mean 5.075
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340	Row-Column-Permute shermanACb.mtx Regular Row-Premute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340	Row-Column-Permute shermanACb.mtx Regular	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.080 max 5.120 mean 5.075
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342	Row-Column-Permute shermanACb.mtx Regular Row-Premute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1340 1341 1342 1343	Row-Column-Permute shermanACb.mtx Regular Row-Premute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342	Row-Column-Permute shermanACb.mtx Regular Row-Premute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1340 1341 1342 1343	Row-Column-Permute shermanACb.mtx Regular Row-Premute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1340 1341 1342 1343 1344 1344	Row-Column-Permute shermanACb.mtx Regular Row-Premute Row-Gradient	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1343 1344 1345	Row-Column-Permute shermanACb.mtx Regular Row-Premute Row-Gradient	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1344 1345 1344 1345	Row-Column-Permute shermanACb.mtx Regular Row-Premute Row-Gradient	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 Regular	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.380 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520 H min 10.739 max 10.741 mean 10.740
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1335 1336 1337 1340 1341 1342 1343 1344 1345 1346 1347 1347	Row-Column-Permute shermanACb.mtx Regular Row-Premute Row-Gradient	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 1420	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.740 mean 9.550 H min 10.835 max*10.838 mean 10.836
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1335 1336 1337 1341 1342 1343 1344 1345 1346 1347 1348 1348	Row-Column-Permute shermanACb.mtx Regular Row-Premute Row-Gradient Column-Gradient	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.080 max 9.460 mean 8.520 H min 10.739 max 10.741 mean 10.740  GPU 64 COO min 5.140 max* 5.140 mean 5.140 CSR min 10.340 max*10.390 mean 10.365
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1340 1341 1342 1343 1344 1343 1344 1343 1344 1343 1344 1345 1347 1348 1347 1348 1347 1348 1347 1348 1347 1348 1347 1348	Row-Column-Permute shermanACb.mtx Regular Row-Premute Row-Gradient Column-Gradient	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.740 mean 9.550 H min 10.835 max*10.838 mean 10.836
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1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351	Row-Column-Permute  shermanACb.mtx Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421 1422 1423 Row-Premute	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.836 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520 H min 10.739 max 10.741 mean 10.740  GPU 64 COO min 5.140 max* 5.140 mean 5.140 CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689
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1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351	Row-Column-Permute  shermanACb.mtx Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421 1422 1423 Row-Premute	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.836 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520 H min 10.739 max 10.741 mean 10.740  GPU 64 COO min 5.140 max* 5.140 mean 5.140 CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1335 1336 1337 1341 1342 1343 1344 1345 1346 1347 1348 1349 1349 1340 1341 1345 1346 1347 1348 1349 1349 1350	Row-Column-Permute  shermanACb.mtx Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421 1422 1423 Row-Premute	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.085 CSR min 9.720 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520 H min 10.739 max 10.741 mean 10.740  GPU 64 COO min 5.140 max* 5.140 mean 5.140 CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 5.140 max* 5.140 mean 5.140 CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1340 1341 1343 1344 1343 1344 1343 1344 1345 1347 1348 1347 1348 1349 1350 1351 1350	Row-Column-Permute  shermanACb.mtx Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421 1422 1423 Row-Premute 1424 1425 1426 1427 Row-Gradient	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 10.836 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 10.740  GPU 64 COO min 5.140 max* 5.140 mean 5.140 CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 10.689 mean 9.685  GPU 64 COO min 5.140 max 10.390 mean 10.365 H min 9.689 max 9.430 mean 9.425 H min 9.689 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1355 1356	Row-Column-Permute  shermanACb.mtx Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421 1422 1423 Row-Premute 1424 1425 1426 1427 Row-Gradient	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.080 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520 H min 10.739 max 10.741 mean 10.740  GPU 64 COO min 5.140 max* 5.140 mean 5.406 CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.739
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1355 1355 1355 1355	Row-Column-Permute  shermanACb.mtx Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute  TSOPF_FS_b9_c6.mtx Regular	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1409 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1415 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421 1422 1423 Row-Premute 1424 1425 1426 1427 Row-Gradient 1428 1429	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.610 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.085 CSR min 9.720 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.000 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520 H min 10.739 max 10.741 mean 10.740  GPU 64 COO min 5.140 max* 5.140 mean 5.140 CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 10.739  GPU 64 COO min 5.080 max 5.090 mean 5.085 CSR min 9.420 max 9.430 mean 10.739
1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1352 1353 1353	Row-Column-Permute  shermanACb.mtx Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute	H min 11.109 max 11.116 mean 11.113  GPU 64 COO min 3.690 max 3.870 mean 3.804	1397 mult_dcop_03.mtx 1398 Regular 1399 1400 1401 1402 Row-Premute 1403 1404 1405 1406 Row-Gradient 1407 1408 1410 Column-Gradient 1411 1412 1413 1414 Row-Column-Permute 1416 1417 1418 mult_dcop_03.mtx 1419 Regular 1420 1421 1422 1423 Row-Premute 1424 1425 1426 1427 Row-Gradient	CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.010 H min 10.579 max 10.582 mean 10.580  GPU 64 COO min 5.030 max 5.120 mean 5.075 CSR min 9.330 max 9.770 mean 9.550 H min 10.835 max*10.838 mean 10.836  GPU 64 COO min 5.080 max 5.010 mean 5.005 CSR min 7.580 max 9.460 mean 8.520 H min 10.739 max 10.741 mean 10.740  GPU 64 COO min 5.140 max* 5.140 mean 5.406 CSR min 10.340 max*10.390 mean 10.365 H min 9.689 max 9.689 mean 9.689  GPU 64 COO min 4.970 max 4.990 mean 4.980 CSR min 9.420 max 9.430 mean 9.425 H min 10.739 max 10.739 mean 10.739  GPU 64 COO min 5.080 max 5.990 mean 10.739

1431	Column-Gradient		1505	CSR min 6.360 max 7.450 mean 6.711
1432		GPU 64 COO min 5.030 max 5.120 mean 5.075	1506	H min 11.109 max 11.109 mean 11.109
1433		CSR min 9.330 max 9.770 mean 9.550	1507 Row-Premute	
1434		H min 10.835 max*10.838 mean 10.836	1508	GPU 64 COO min 3.950 max* 3.980 mean 3.953
1435	Row-Column-Permute		1509	CSR min 6.330 max 7.400 mean 6.661
1436		GPU 64 COO min 5.000 max 5.010 mean 5.005	1510	H min 11.098 max 11.104 mean 11.101
1437		CSR min 7.580 max 9.460 mean 8.520	1511 Row-Gradient	
1438		H min 10.739 max 10.741 mean 10.740	1512	GPU 64 COO min 3.960 max 3.980 mean 3.961
1439	mult_dcop_03.mtx		1513	CSR min 6.270 max*10.770 mean 7.017
1440	Regular		1514	H min 11.109 max 11.109 mean 11.109
1441		GPU 64 COO min 5.130 max* 5.220 mean 5.142	1515 Column-Gradient	
1442		CSR min 7.250 max* 9.320 mean 7.722	1516	GPU 64 COO min 3.940 max 3.960 mean 3.950
1443		H min 9.689 max 9.689 mean 9.689	1517	CSR min 6.270 max 7.370 mean 6.696
1444	Row-Premute		1518	H min 11.329 max*11.334 mean 11.331
1445		GPU 64 COO min 4.980 max 5.030 mean 4.999	1519 Row-Column-Permute	
1446		CSR min 6.460 max 8.470 mean 6.950	1520	GPU 64 COO min 3.950 max 3.960 mean 3.952
1447		H min 10.738 max 10.742 mean 10.740	1521	CSR min 6.180 max 7.420 mean 6.641
1448	Row-Gradient		1522	H min 11.098 max 11.105 mean 11.101
1449		GPU 64 COO min 5.070 max 5.140 mean 5.088	1523 bloweya.mtx	
1450		CSR min 6.780 max 8.700 mean 7.268	1524 Regular	
1451		H min 10.572 max 10.584 mean 10.580	1525	GPU 64 COO min 0.000 max 0.000 mean 0.000
1452	Column-Gradient	11 10.572 max 10.501 mcan 10.500	1526	CSR min 0.000 max 0.000 mean 0.000
1453		GPU 64 COO min 4.980 max 5.030 mean 5.010	1527	H min 7.205 max 7.205 mean 7.205
1454		CSR min 6.390 max 7.640 mean 6.982	1528 Row-Premute	
1455		H min 10.825 max*10.845 mean 10.836	1529	GPU 64 COO min 4.020 max 4.030 mean 4.023
1456	Row-Column-Permute	11 IIII 10.025 IIIAX-10.045 IIICAII 10.030	1530	CSR min 6.070 max 6.750 mean 6.340
1457	NOW-COTUMNIT-FET MULE	GPU 64 COO min 4.990 max 5.010 mean 4.997	1531	H min 11.025 max 11.031 mean 11.028
1457		CSR min 6.300 max 7.160 mean 6.636	1531 1532 Row-Gradient	n miin 11.025 max 11.031 mean 11.028
				CPU 54 600 4 000 4 150 4 111
1459		H min 10.738 max 10.743 mean 10.740	1533	GPU 64 COO min 4.090 max* 4.160 mean 4.111
1460	mult_dcop_01.mtx		1534	CSR min 5.980 max* 7.370 mean 6.678
1461	Regular		1535	H min 10.295 max 10.304 mean 10.300
1462		GPU 64 COO min 5.120 max* 5.140 mean 5.134	1536 Column-Gradient	
1463		CSR min 6.990 max* 9.230 mean 7.546	1537	GPU 64 COO min 3.980 max 4.010 mean 3.995
1464		H min 9.689 max 9.689 mean 9.689	1538	CSR min 5.880 max 6.780 mean 6.295
1465	Row-Premute		1539	H min 10.881 max*10.887 mean 10.883
1466		GPU 64 COO min 4.990 max 5.020 mean 5.004	1540 Row-Column-Permute	
1467		CSR min 6.370 max 7.220 mean 6.771	1541	GPU 64 COO min 4.020 max 4.030 mean 4.023
1468		H min 10.738 max 10.743 mean 10.740	1542	CSR min 5.970 max 6.420 mean 6.183
1469	Row-Gradient		1543	H min 11.025 max 11.033 mean 11.028
1470		GPU 64 COO min 5.060 max 5.100 mean 5.082	1544 lp_osa_07.mtx	
1471		CSR min 6.730 max 7.720 mean 7.317	1545 Regular	
1472		H min 10.574 max 10.585 mean 10.580	1546	GPU 64 COO min 4.260 max* 4.270 mean 4.261
1473	Column-Gradient		1547	CSR min 6.440 max 7.640 mean 6.863
1474		GPU 64 COO min 4.980 max 5.100 mean 5.012	1548	H min 8.412 max 8.412 mean 8.412
1475		CSR min 6.580 max 7.510 mean 7.054	1549 Row-Premute	
1476		H min 10.828 max*10.842 mean 10.835	1550	GPU 64 COO min 4.200 max 4.200 mean 4.200
1477	Row-Column-Permute		1551	CSR min 6.020 max 7.030 mean 6.418
1478		GPU 64 COO min 4.970 max 5.000 mean 4.986	1552	H min 9.255 max 9.257 mean 9.256
1479		CSR min 6.390 max 7.050 mean 6.677	1553 Row-Gradient	
1480		H min 10.738 max 10.742 mean 10.740	1554	GPU 64 COO min 4.210 max 4.240 mean 4.226
1481	mult_dcop_02.mtx		1555	CSR min 6.070 max*10.050 mean 6.498
1482	Regular		1556	H min 8.607 max 8.678 mean 8.671
1483		GPU 64 COO min 5.120 max 5.140 mean 5.133	1557 Column-Gradient	
1484		CSR min 6.950 max 7.590 mean 7.336	1558	GPU 64 COO min 4.170 max 4.190 mean 4.180
1485		H min 9.689 max 9.689 mean 9.689	1559	CSR min 5.610 max 7.300 mean 5.988
1486	Row-Premute		1560	H min 9.534 max* 9.601 mean 9.585
1487		GPU 64 COO min 4.970 max 4.990 mean 4.984	1561 Row-Column-Permute	
1488		CSR min 6.440 max 7.110 mean 6.719	1562	GPU 64 COO min 4.190 max 4.190 mean 4.190
1489		H min 10.738 max 10.742 mean 10.740	1563	CSR min 6.070 max 7.000 mean 6.386
1490	Row-Gradient		1564	H min 9.255 max 9.257 mean 9.256
1491		GPU 64 COO min 5.070 max* 5.150 mean 5.086	1565 ex19.mtx	
1492		CSR min 6.650 max* 7.930 mean 7.304	1566 Regular	
1493		H min 10.574 max 10.587 mean 10.580	1567	GPU 64 COO min 6.140 max* 6.180 mean 6.159
1494	Column-Gradient		1568	CSR min 12.780 max*14.400 mean 13.328
1495		GPU 64 COO min 4.980 max 5.040 mean 5.012	1569	H min 8.228 max 8.228 mean 8.228
1496		CSR min 6.520 max 7.650 mean 7.139	1570 Row-Premute	2.22 max 0.220 mcan 0.220
1497		H min 10.829 max*10.846 mean 10.836	1571	GPU 64 COO min 5.820 max 5.850 mean 5.833
1498	Row-Column-Permute	man 10.025 max 10.040 mean 10.030	1572	CSR min 9.870 max 11.070 mean 10.372
1498	NOW COTUMNITED HINTE	GPU 64 COO min 4.970 max 5.050 mean 4.983	1573	H min 11.836 max 11.840 mean 11.838
1500		CSR min 6.440 max 7.380 mean 4.983		min 11.030 Max 11.040 Mean 11.838
			1574 Row-Gradient	GPU 64 COO min 6.070 max 6.120 mean 6.104
1501	1- 61404	H min 10.738 max 10.743 mean 10.740	1575	
1502	lp_fit2d.mtx		1576	CSR min 11.290 max 12.760 mean 12.088
1503	Regular	CDU 64 000 m/m 2 000 m 2 000	1577	H min 10.743 max 10.752 mean 10.748
1504		GPU 64 COO min 3.960 max 3.960 mean 3.960	1578 Column-Gradient	

4570		CDU C4 C00 F 7C0 F 040 F 012	4652	
1579		GPU 64 COO min 5.760 max 5.840 mean 5.813 CSR min 9.710 max 14.220 mean 10.376	1653	H min 7.380 max 7.380 mean 7.380
1580 1581		H min 11.873 max*11.882 mean 11.878	1654 Row-Premute 1655	GPU 64 COO min 4.130 max 4.170 mean 4.134
1582	Row-Column-Permute	n	1656	CSR min 6.180 max* 9.200 mean 6.796
1583	Now Column 1 crimate	GPU 64 COO min 5.810 max 5.860 mean 5.838	1657	H min 10.041 max 10.046 mean 10.044
1584		CSR min 9.920 max 10.820 mean 10.240	1658 Row-Gradient	
1585		H min 11.836 max 11.841 mean 11.838	1659	GPU 64 COO min 4.150 max* 4.220 mean 4.163
1586	brainpc2.mtx		1660	CSR min 6.410 max 7.500 mean 6.816
1587	Regular		1661	H min 9.682 max 9.706 mean 9.693
1588		GPU 64 COO min 0.000 max 0.000 mean 0.000	1662 Column-Gradient	
1589		CSR min 0.000 max 0.000 mean 0.000	1663	GPU 64 COO min 4.080 max 4.110 mean 4.096
1590		H min 7.478 max 7.478 mean 7.478	1664	CSR min 6.020 max 7.220 mean 6.309
1591	Row-Premute		1665	H min 10.597 max*10.658 mean 10.631
1592		GPU 64 COO min 4.760 max 4.790 mean 4.773	1666 Row-Column-Permute	
1593		CSR min 6.930 max 7.780 mean 7.310 H min 9.810 max 9.813 mean 9.811	1667	GPU 64 COO min 4.120 max 4.140 mean 4.130 CSR min 6.210 max 7.200 mean 6.609
1594 1595	Row-Gradient	11 11111 5.010 1110X 5.013 111edii 5.011	1668 1669	H min 10.041 max 10.046 mean 10.044
1596	Now or adject	GPU 64 COO min 4.820 max* 4.840 mean 4.831	1670 TSOPF_FS_b9_c6.mtx	11 III 10.041 IIIAX 10.040 IIICAN 10.044
1597		CSR min 7.220 max 8.290 mean 7.583	1671 Regular	
1598		H min 9.721 max 9.725 mean 9.723	1672	GPU 64 COO min 0.000 max 0.000 mean 0.000
1599	Column-Gradient		1673	CSR min 0.000 max 0.000 mean 0.000
1600		GPU 64 COO min 4.760 max 4.820 mean 4.779	1674	H min 7.380 max 7.380 mean 7.380
1601		CSR min 6.870 max* 8.300 mean 7.393	1675 Row-Premute	
1602		H min 10.368 max*10.373 mean 10.370	1676	GPU 64 COO min 4.120 max 4.140 mean 4.129
1603	Row-Column-Permute		1677	CSR min 6.170 max 7.160 mean 6.664
1604		GPU 64 COO min 4.750 max 4.780 mean 4.765	1678	H min 10.041 max 10.045 mean 10.043
1605		CSR min 6.940 max 7.580 mean 7.298	1679 Row-Gradient	
1606 1607	shermanACb.mtx	H min 9.809 max 9.814 mean 9.811	1680 1681	GPU 64 COO min 4.150 max* 4.180 mean 4.162 CSR min 6.420 max 7.360 mean 6.723
1607	Regular		1682	H min 9.682 max 9.706 mean 9.693
1609	Regulai	GPU 64 COO min 4.090 max* 4.130 mean 4.112	1683 Column-Gradient	11 IIII1 9.002 IIIAX 9.700 IIIEAII 9.093
1610		CSR min 6.320 max* 7.200 mean 6.779	1684	GPU 64 COO min 4.080 max 4.120 mean 4.096
1611		H min 8.600 max 8.600 mean 8.600	1685	CSR min 5.880 max 7.090 mean 6.403
1612	Row-Premute		1686	H min 10.611 max*10.660 mean 10.637
1613		GPU 64 COO min 4.020 max 4.050 mean 4.036	1687 Row-Column-Permute	
1614		CSR min 5.670 max 6.460 mean 6.014	1688	GPU 64 COO min 4.130 max 4.140 mean 4.130
1615		H min 10.376 max 10.382 mean 10.379	1689	CSR min 6.330 max* 7.390 mean 6.695
1616	Row-Gradient		1690	H min 10.042 max 10.047 mean 10.044
1617		GPU 64 COO min 4.050 max 4.100 mean 4.074		
			1691 OPF_6000.mtx	
1618		CSR min 5.580 max 6.420 mean 5.996	1692 Regular	CDU 64 COO min 7 270 mout 7 270 mon 7 202
1619	Column-Gradient		1692 Regular 1693	GPU 64 COO min 7.270 max* 7.370 mean 7.293
1619 1620	Column-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921	1692 Regular 1693 1694	CSR min 12.890 max*14.500 mean 13.566
1619 1620 1621	Column-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033	1692 Regular 1693	CSR min 12.890 max*14.500 mean 13.566
1619 1620	Column-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921	1692 Regular 1693 1694 1695	CSR min 12.890 max*14.500 mean 13.566
1619 1620 1621 1622	Column-Gradient Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527	1692 Regular 1693 1694 1695 1696 Row-Premute	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799
1619 1620 1621 1622 1623		CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036	1692 Regular 1693 1694 1695 1696 Row-Premute 1697	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678
1619 1620 1621 1622 1623 1624 1625 1626		CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678  CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875
1619 1620 1621 1622 1623 1624 1625 1626 1627	Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122
1619 1620 1621 1622 1623 1624 1625 1626 1627	Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629	Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630	Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630	Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630	Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631	Row-Column-Permute cvxqp3.mtx Regular	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633	Row-Column-Permute cvxqp3.mtx Regular	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633	Row-Column-Permute cvxqp3.mtx Regular	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1633 1634 1635	Row-Column-Permute cvxqp3.mtx Regular	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646 GPU 64 COO min 3.3500 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute 1709 1711	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.360 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1630 1631 1632 1633 1634 1635 1636 1637 1638	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute 1709 1710 1711 1711 1712 OPF_3754.mtx 1713 Regular	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1630 1631 1632 1633 1634 1635 1636 1637 1638	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.360 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1630 1631 1632 1633 1634 1635 1636 1637 1638	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.360 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.070 mean 6.499 H min 11.059 max 11.068 mean 11.064	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1630 1631 1631 1632 1633 1634 1635 1637 1638 1639 1639 1640 1641	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.360 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.070 mean 6.499 H min 11.059 max 11.068 mean 11.064	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 12.043  GPU 64 COO min 6.640 max 12.046 mean 12.043  GPU 64 COO min 6.640 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875
1619 1620 1621 1623 1624 1625 1626 1627 1630 1631 1633 1634 1635 1636 1637 1638 1639 1640	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.360 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.070 mean 6.499 H min 11.059 max 11.068 mean 11.064	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 12.043  GPU 64 COO min 6.640 max 12.046 mean 12.043  GPU 64 COO min 6.640 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1633 1634 1635 1636 1637 1638 1639 1640 1641 1641	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.370 max 10.381 mean 10.339  GPU 64 COO min 3.500 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.070 mean 6.499 H min 11.059 max 11.068 mean 11.064  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1706 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716 1717 Row-Premute	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875  GPU 64 COO min 4.430 max* 4.450 mean 4.443 CSR min 9.710 max*13.000 mean 11.377 H min 8.393 max 8.393 mean 8.393
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1630 1631 1633 1633 1634 1635 1636 1637 1640 1641	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient  Column-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.370 max 10.381 mean 10.339  GPU 64 COO min 3.500 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.070 mean 6.499 H min 11.059 max 11.068 mean 11.064  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1705 1706 1707 1708 Row-Column-Permute 1709 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716 1717 Row-Premute	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875  GPU 64 COO min 4.430 max* 4.450 mean 4.443 CSR min 9.710 max*13.000 mean 11.377 H min 8.393 max 8.393 mean 8.393  GPU 64 COO min 4.230 max 4.250 mean 4.240
1619 1620 1621 1622 1623 1624 1625 1626 1627 1626 1627 1630 1631 1633 1634 1635 1638 1639 1636 1637 1638 1639 1640 1641 1642	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient  Column-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.370 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.70 mean 6.499 H min 11.059 max 11.068 mean 11.064  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.055 max 11.068 mean 11.130  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.125 max*11.133 mean 11.130	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716 1717 Row-Premute	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.850 H min 11.874 max 11.877 mean 11.875  GPU 64 COO min 4.430 max* 4.450 mean 4.443 CSR min 9.710 max*13.000 mean 11.377 H min 8.393 max 8.393 mean 8.393  GPU 64 COO min 4.230 max 4.250 mean 4.240 CSR min 7.430 max 4.250 mean 7.986 H min 11.266 max 11.272 mean 11.269
1619 1620 1621 1622 1623 1624 1625 1626 1627 1626 1630 1631 1631 1634 1635 1637 1638 1639 1640 1641 1642 1643 1644 1645	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient  Column-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.360 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.070 mean 6.499 H min 11.059 max 11.068 mean 11.064  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.125 max*11.133 mean 11.130	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716 1717 Row-Premute 1718 1719 1720 1721 Row-Gradient	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max 12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875  GPU 64 COO min 4.430 max* 4.450 mean 4.443 CSR min 9.710 max*13.000 mean 11.377 H min 8.393 max 8.393 mean 8.393  GPU 64 COO min 4.230 max 4.250 mean 7.986 H min 11.266 max 11.272 mean 11.269
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1630 1631 1633 1634 1635 1636 1637 1638 1639 1640 1640 1641 1642 1644 1645 1644 1645	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.370 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.70 mean 6.499 H min 11.059 max 11.068 mean 11.064  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.055 max 11.068 mean 11.130  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.125 max*11.133 mean 11.130	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716 1717 Row-Premute 1718 1719 1720 1721 Row-Gradient 1722 1723	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875  GPU 64 COO min 4.430 max* 4.450 mean 4.443 CSR min 9.710 max*13.000 mean 11.377 H min 8.393 max 8.393 mean 8.393  GPU 64 COO min 4.230 max 4.250 mean 4.240 CSR min 7.430 max 8.750 mean 7.986 H min 11.266 max 11.272 mean 11.269  GPU 64 COO min 4.370 max 4.420 mean 4.382 CSR min 8.160 max 9.470 mean 4.382 CSR min 8.160 max 9.470 mean 4.862
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1644 1645 1646 1647 1646 1647	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient  Column-Gradient	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.360 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.070 mean 6.499 H min 11.059 max 11.068 mean 11.064  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.125 max*11.133 mean 11.130  GPU 64 COO min 3.350 max 3.380 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.125 max*11.133 mean 11.130	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1706 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716 1717 Row-Premute 1718 1719 1720 1721 Row-Gradient 1722 1721 Row-Gradient	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max 12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875  GPU 64 COO min 4.430 max* 4.450 mean 4.443 CSR min 9.710 max*13.000 mean 11.377 H min 8.393 max 8.393 mean 8.393  GPU 64 COO min 4.230 max 4.250 mean 7.986 H min 11.266 max 11.272 mean 11.269
1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1630 1631 1633 1634 1635 1636 1637 1638 1639 1640 1640 1641 1642 1644 1645 1644 1645	Row-Column-Permute  cvxqp3.mtx  Regular  Row-Premute  Row-Gradient  Column-Gradient  Row-Column-Permute	CSR min 5.580 max 6.420 mean 5.996 H min 9.918 max 9.924 mean 9.921  GPU 64 COO min 4.010 max 4.080 mean 4.033 CSR min 0.000 max 6.320 mean 5.527 H min 10.543 max*10.595 mean 10.589  GPU 64 COO min 4.020 max 4.050 mean 4.036 CSR min 5.670 max 6.510 mean 6.092 H min 10.377 max 10.381 mean 10.379  GPU 64 COO min 3.500 max* 3.540 mean 3.501 CSR min 11.860 max*13.100 mean 12.694 H min 8.646 max 8.646 mean 8.646  GPU 64 COO min 3.370 max 3.370 mean 3.365 CSR min 6.210 max 7.610 mean 6.631 H min 11.027 max 11.032 mean 11.030  GPU 64 COO min 3.370 max 3.380 mean 3.376 CSR min 6.170 max 7.70 mean 6.499 H min 11.059 max 11.068 mean 11.064  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.055 max 11.068 mean 11.130  GPU 64 COO min 3.350 max 3.390 mean 3.371 CSR min 6.150 max 7.180 mean 6.531 H min 11.125 max*11.133 mean 11.130	1692 Regular 1693 1694 1695 1696 Row-Premute 1697 1698 1699 1700 Row-Gradient 1701 1702 1703 1704 Column-Gradient 1707 1708 Row-Column-Permute 1709 1710 1711 1712 OPF_3754.mtx 1713 Regular 1714 1715 1716 1717 Row-Premute 1718 1719 1720 1721 Row-Gradient 1722 1723	CSR min 12.890 max*14.500 mean 13.566 H min 8.799 max 8.799 mean 8.799  GPU 64 COO min 6.640 max 6.720 mean 6.678 CSR min 9.680 max 11.600 mean 10.040 H min 11.873 max 11.877 mean 11.875  GPU 64 COO min 7.090 max 7.140 mean 7.122 CSR min 11.250 max 13.030 mean 12.142 H min 11.110 max 11.117 mean 11.114  GPU 64 COO min 6.590 max 6.710 mean 6.644 CSR min 9.400 max 13.140 mean 9.991 H min 12.040 max*12.046 mean 12.043  GPU 64 COO min 6.640 max 6.710 mean 6.679 CSR min 9.690 max 10.740 mean 10.050 H min 11.874 max 11.877 mean 11.875  GPU 64 COO min 4.430 max* 4.450 mean 4.443 CSR min 9.710 max*13.000 mean 11.377 H min 8.393 max 8.393 mean 8.393  GPU 64 COO min 4.230 max 4.250 mean 4.240 CSR min 7.430 max 8.750 mean 7.986 H min 11.266 max 11.272 mean 11.269  GPU 64 COO min 4.370 max 4.420 mean 4.382 CSR min 8.160 max 9.470 mean 4.382 CSR min 8.160 max 9.470 mean 4.862

1727		CSR min 7.160 max 8.080 mean 7.595	1801 Row-Premute	CPU 64 000 min 10 240 min 10 420 min 10 262
1728 1729	Row-Column-Permute	H min 11.394 max*11.401 mean 11.398	1802 1803	GPU 64 COO min 10.340 max 10.430 mean 10.362 CSR min 12.880 max 13.340 mean 13.057
1730	Kow-Column-Permute	GPU 64 COO min 4.230 max 4.250 mean 4.243	1804	H min 10.777 max 10.778 mean 10.777
1731		CSR min 7.230 max 8.940 mean 8.056	1805 Row-Gradient	min 10.777 max 10.776 mean 10.777
1732		H min 11.264 max 11.271 mean 11.269	1806	GPU 64 COO min 10.650 max*10.740 mean 10.688
1733	c-47.mtx		1807	CSR min 12.310 max 13.670 mean 12.562
1734	Regular		1808	H min 11.247 max 11.300 mean 11.281
1735		GPU 64 COO min 5.320 max* 5.340 mean 5.329	1809 Column-Gradient	
1736		CSR min 8.890 max* 9.590 mean 9.249	1810	GPU 64 COO min 10.340 max 10.440 mean 10.398
1737		H min 8.364 max 8.364 mean 8.364	1811	CSR min 9.480 max 10.110 mean 9.782
1738	Row-Premute		1812	H min 12.023 max*12.069 mean 12.047
1739		GPU 64 COO min 5.240 max 5.250 mean 5.241	1813 Row-Column-Permute	
1740		CSR min 7.790 max 8.890 mean 8.214 H min 10.059 max 10.063 mean 10.061	1814	GPU 64 COO min 10.330 max 10.380 mean 10.356
1741 1742	Row-Gradient	H min 10.059 max 10.063 mean 10.061	1815	CSR min 12.840 max 13.530 mean 13.119 H min 10.776 max 10.778 mean 10.777
1743	Row-Gradient	GPU 64 COO min 5.230 max 5.260 mean 5.242	1816 1817 aft01.mtx	n IIIIn 10.776 IIIax 10.778 IIIean 10.777
1744		CSR min 7.080 max 8.050 mean 7.673	1818 Regular	
1745		H min 10.206 max 10.226 mean 10.218	1819	GPU 64 COO min 3.680 max* 3.690 mean 3.688
1746	Column-Gradient		1820	CSR min 13.860 max*14.830 mean 14.560
1747		GPU 64 COO min 5.080 max 5.120 mean 5.105	1821	H min 7.811 max 7.811 mean 7.811
1748		CSR min 5.780 max 6.970 mean 6.359	1822 Row-Premute	
1749		H min 11.205 max*11.233 mean 11.222	1823	GPU 64 COO min 3.510 max 3.530 mean 3.513
1750	Row-Column-Permute		1824	CSR min 6.420 max 10.520 mean 7.265
1751		GPU 64 COO min 5.220 max 5.250 mean 5.227	1825	H min 11.161 max*11.170 mean 11.165
1752		CSR min 7.860 max 8.710 mean 8.247	1826 Row-Gradient	
1753		H min 10.059 max 10.064 mean 10.061	1827	GPU 64 COO min 3.630 max 3.670 mean 3.643
1754	mhd4800a.mtx		1828	CSR min 10.760 max 13.510 mean 12.199
1755 1756	Regular	GPU 64 COO min 3.090 max* 3.100 mean 3.098	1829 1830 Column-Gradient	H min 10.248 max 10.265 mean 10.258
1757		CSR min 11.570 max*12.290 mean 12.092	1831 COTUMN=Gradient	GPU 64 COO min 3.510 max 3.520 mean 3.519
1758		H min 7.132 max 7.132 mean 7.132	1832	CSR min 6.490 max 11.230 mean 7.645
1759	Row-Premute	III IIII 7.132 III 7.132 III GAI 7.132	1833	H min 11.112 max 11.121 mean 11.117
1760		GPU 64 COO min 3.020 max 3.020 mean 3.020	1834 Row-Column-Permute	
1761		CSR min 5.560 max 7.270 mean 6.007	1835	GPU 64 COO min 3.510 max 3.540 mean 3.515
1762		H min 10.959 max*10.968 mean 10.963	1836	CSR min 6.510 max 11.650 mean 7.311
1763	Row-Gradient		1837	H min 11.161 max 11.168 mean 11.165
1764		GPU 64 COO min 3.080 max 3.100 mean 3.088	1838 TSOPF_RS_b39_c7.mtx	
1765		CSR min 10.250 max 12.150 mean 11.340	1839 Regular	
1766		H min 9.509 max 9.528 mean 9.520	1840	GPU 64 COO min 5.970 max* 6.010 mean 5.988
1767	Column-Gradient	CDU 64 600 m/m 2 000 mm 2 050 mm 2 005	1841	CSR min 12.470 max*21.120 mean 13.816
1768 1769		GPU 64 COO min 3.020 max 3.050 mean 3.026 CSR min 5.530 max 10.580 mean 6.432	1842 1843 Row-Premute	H min 7.304 max 7.304 mean 7.304
1770		H min 10.933 max 10.946 mean 10.939	1844	GPU 64 COO min 5.840 max 5.870 mean 5.856
1771	Row-Column-Permute	11 IIII 10.555 IIIAX 10.546 IIICAII 10.555	1845	CSR min 10.780 max 15.810 mean 11.425
1772		GPU 64 COO min 3.020 max 3.020 mean 3.020	1846	H min 10.537 max 10.540 mean 10.539
1773		CSR min 5.510 max 6.830 mean 6.136	1847 Row-Gradient	
1774		H min 10.959 max 10.967 mean 10.963	1848	GPU 64 COO min 5.950 max 6.000 mean 5.975
1775	gen4.mtx		1849	CSR min 11.520 max 17.250 mean 12.799
1776	Regular		1850	H min 9.638 max 9.646 mean 9.641
1777		GPU 64 COO min 3.300 max* 3.320 mean 3.308	1851 Column-Gradient	
1778		CSR min 5.250 max 6.340 mean 5.705	1852	GPU 64 COO min 5.790 max 5.860 mean 5.827
1779	Davi Daamida	H min 9.234 max 9.234 mean 9.234	1853	CSR min 10.500 max 14.080 mean 11.237 H min 11.128 max*11.223 mean 11.209
1780 1781	Row-Premute	GPU 64 COO min 3.290 max 3.310 mean 3.299	1854 1855 Row-Column-Permute	H min   . 28 max*  .223 mean   .209
1782		CSR min 5.190 max 7.420 mean 5.683	1856	GPU 64 COO min 5.850 max 5.870 mean 5.855
1783		H min 10.249 max 10.254 mean 10.252	1857	CSR min 10.790 max 15.250 mean 11.718
1784	Row-Gradient		1858	H min 10.537 max 10.541 mean 10.539
1785		GPU 64 COO min 3.300 max 3.310 mean 3.301	1859 mult_dcop_03.mtx	
1786		CSR min 5.370 max 6.310 mean 5.659	1860 Regular	
1787		H min 9.934 max 9.958 mean 9.948	1861	GPU 64 COO min 5.130 max* 5.220 mean 5.142
1788	Column-Gradient		1862	CSR min 7.250 max* 9.320 mean 7.722
1789		GPU 64 COO min 3.240 max 3.260 mean 3.249	1863	H min 9.689 max 9.689 mean 9.689
1790		CSR min 5.090 max* 8.660 mean 5.546	1864 Row-Premute	
1791		H min 10.853 max*10.873 mean 10.864	1865	GPU 64 COO min 4.980 max 5.030 mean 4.999
1792	Row-Column-Permute		1866	CSR min 6.460 max 8.470 mean 6.950
1793 1794		GPU 64 COO min 3.290 max 3.320 mean 3.296 CSR min 5.190 max 7.550 mean 5.659	1867 1868 Row-Gradient	H min 10.738 max 10.742 mean 10.740
1794		H min 10.249 max 10.255 mean 10.252	1869 KOW-Gradient	GPU 64 COO min 5.070 max 5.140 mean 5.088
1796	Maragal_6.mtx	min 10.245 max 10.255 mean 10.252	1870	CSR min 6.780 max 8.700 mean 7.268
1797	Regular		1871	H min 10.572 max 10.584 mean 10.580
1798		GPU 64 COO min 10.580 max 10.620 mean 10.599	1872 Column-Gradient	
1799		CSR min 15.620 max*16.470 mean 15.832	1873	GPU 64 COO min 4.980 max 5.030 mean 5.010
1800		H min 9.930 max 9.930 mean 9.930	1874	CSR min 6.390 max 7.640 mean 6.982

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    1875
    H
    min 10.825 max*10.845 mean 10.836

    1876
    Row-Column-Permute

    1877
    GPU 64 COO min 4.990 max 5.010 mean 6.636

    1878
    CRR min 10.738 max 10.743 mean 10.748

    1879
    H
    min 10.738 max 10.743 mean 110.748
```

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