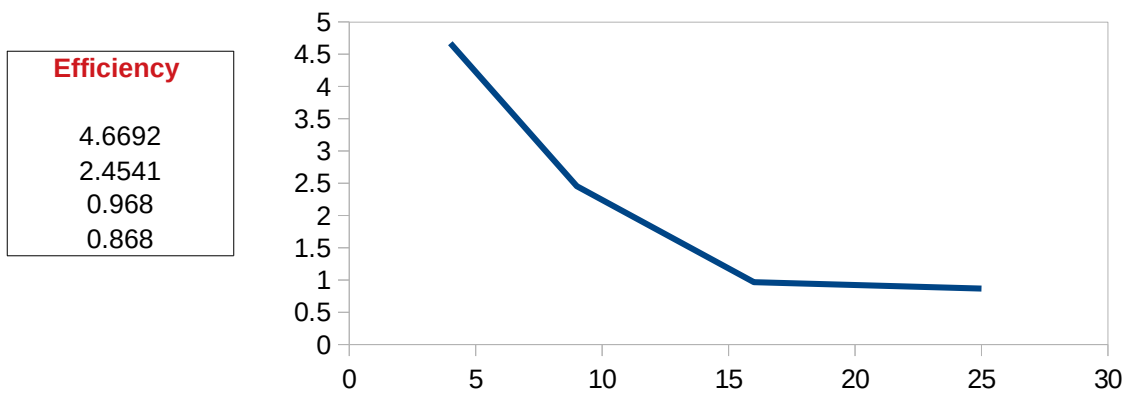


# MPI - Grey

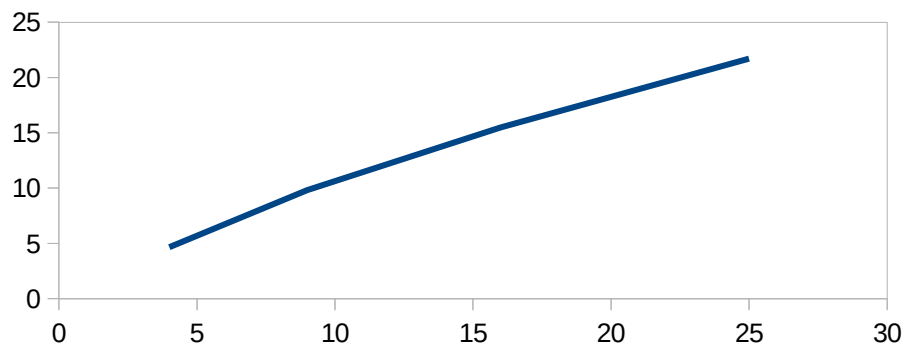
| Num Processes | Size   |        |        |        |
|---------------|--------|--------|--------|--------|
|               | x/4    | x/2    | x      | 2x     |
| 1             | 1.0558 | 1.9974 | 3.8736 | 8.565  |
| 4             | 0.4505 | 0.7455 | 0.8296 | 3.2916 |
| 9             | 0.2074 | 0.3702 | 0.3946 | 1.0829 |
| 16            | 0.061  | 0.1603 | 0.2501 | 0.4459 |
| 25            | 0.0485 | 0.1286 | 0.1785 | 0.3943 |

## Efficiency

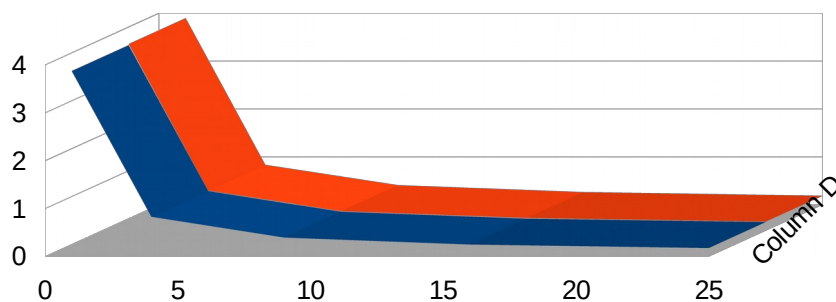


|                 |        |        |         |         |
|-----------------|--------|--------|---------|---------|
| <b>Speed Up</b> | 4.6692 | 9.8165 | 15.4882 | 21.7008 |
|-----------------|--------|--------|---------|---------|

## Speed Up



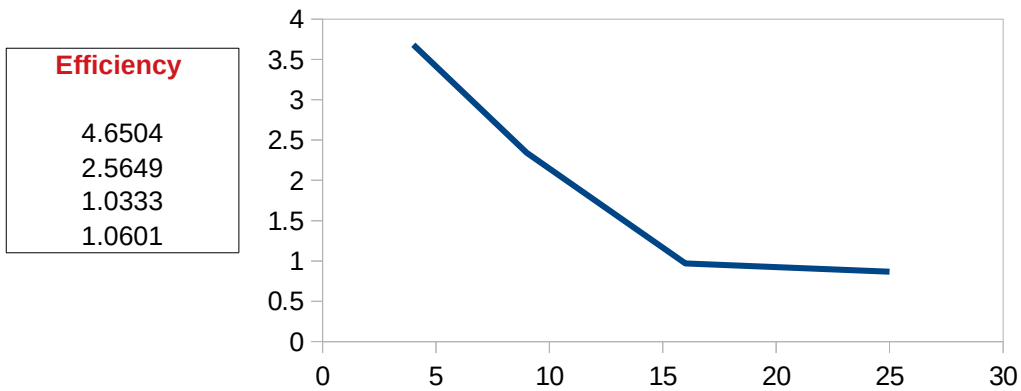
## MPI (Grey) +REDUCE



# MPI - RGB

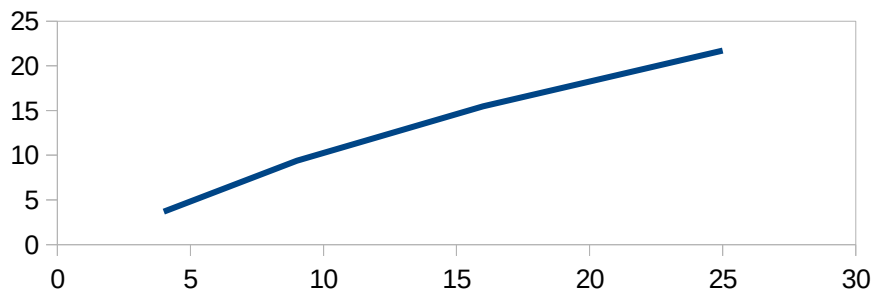
| Num Processes | Size   |        |         |         |
|---------------|--------|--------|---------|---------|
|               | x/4    | x/2    | x       | 2x      |
| 1             | 2.9091 | 5.8028 | 11.6107 | 24.5321 |
| 4             | 0.8065 | 1.2491 | 2.4967  | 4.9802  |
| 9             | 0.2846 | 0.5681 | 1.1317  | 2.3137  |
| 16            | 0.1778 | 0.3515 | 0.7023  | 1.3016  |
| 25            | 0.1203 | 0.2149 | 0.4381  | 0.8322  |

## Efficiency

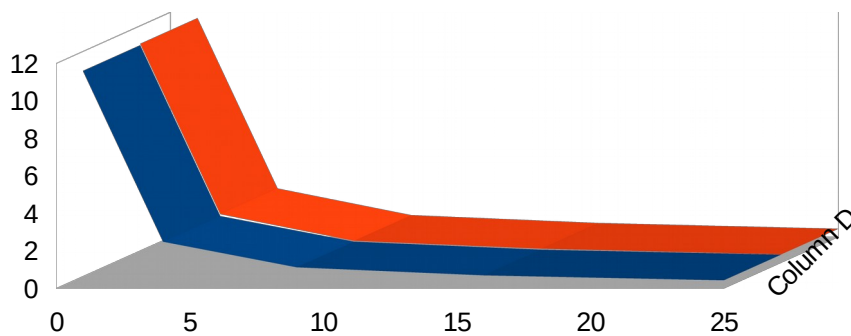


| Speed Up | 4.6504 | 10.2595 | 16.5324 | 26.5024 |
|----------|--------|---------|---------|---------|
|----------|--------|---------|---------|---------|

## Speed Up



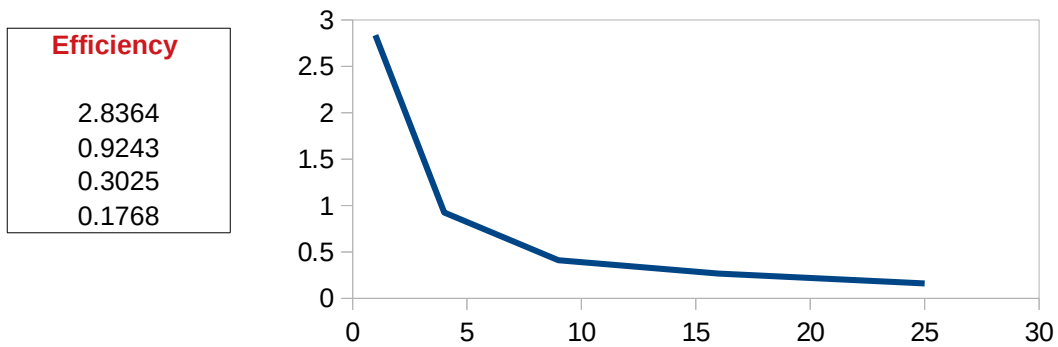
## MPI (RGB) +REDUCE



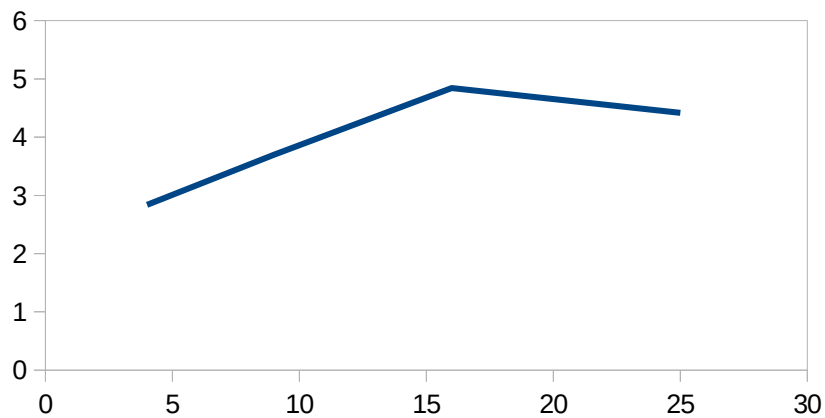
# MPI & OPENMP - Grey

| Num Processes | Size   |        |        |        |
|---------------|--------|--------|--------|--------|
|               | x/4    | x/2    | x      | 2x     |
| 1             | 1.0073 | 1.9679 | 4.2461 | 7.8961 |
| 4             | 0.2758 | 0.4274 | 1.497  | 1.6927 |
| 9             | 0.304  | 0.5612 | 1.1485 | 1.8246 |
| 16            | 0.3866 | 0.4693 | 0.8773 | 1.7121 |
| 25            | 0.392  | 0.533  | 0.9609 | 1.9092 |

## Efficiency



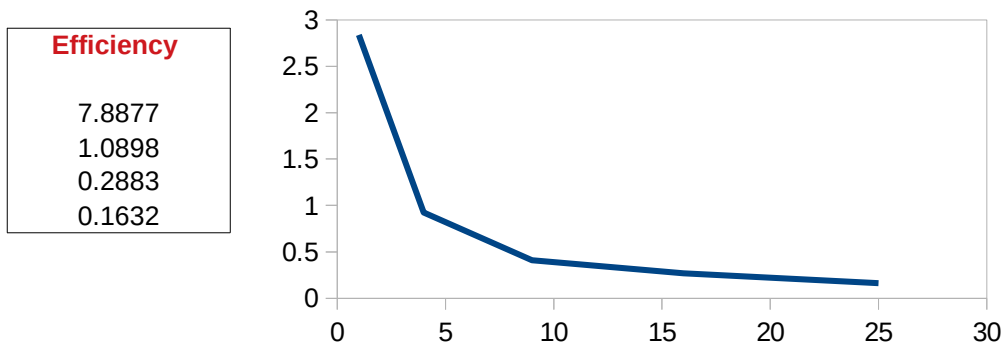
| Speed Up | 2.8364 | 3.6971 | 4.84 | 4.4189 |
|----------|--------|--------|------|--------|
|----------|--------|--------|------|--------|



# MPI & OPENMP - RGB

| Num Processes | Size   |        |         |         |
|---------------|--------|--------|---------|---------|
|               | x/4    | x/2    | x       | 2x      |
| 1             | 2.9568 | 5.9053 | 11.8079 | 23.6391 |
| 4             | 0.8116 | 1.2696 | 1.497   | 5.0679  |
| 9             | 0.848  | 1.3721 | 2.7088  | 5.4694  |
| 16            | 0.8326 | 1.2891 | 2.56    | 5..8893 |
| 25            | 0.7463 | 1.4343 | 2.8935  | 5.7162  |

## Efficiency



|                 |        |        |        |        |
|-----------------|--------|--------|--------|--------|
| <b>Speed Up</b> | 7.8877 | 4.3591 | 4.6125 | 4.0808 |
|-----------------|--------|--------|--------|--------|

## Speed Up

