LAPP
Laboratoire d'Annecy de Physique des Particules

SQRT :
With NaN and Denorm

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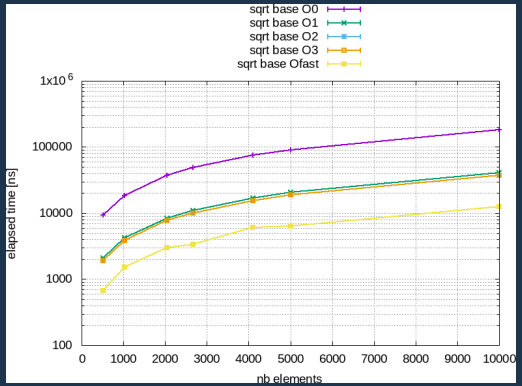
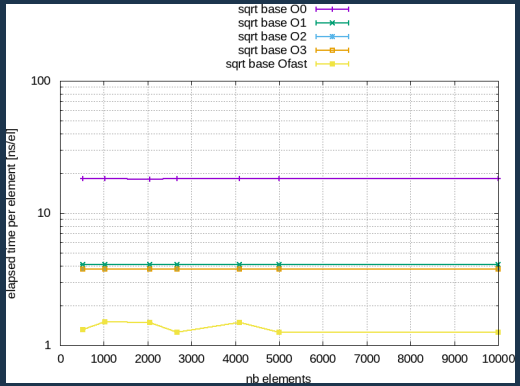
CCFR CENTRE DE COMPÉTENCE HPC.HPDA.IA

SQRT : reference Performances

Total Elapsed Time (cy)

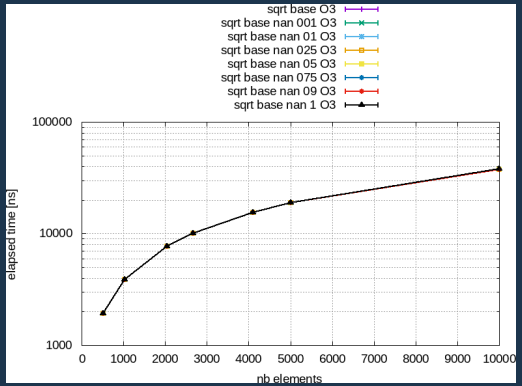


Elapsed Time per element (cy/el)

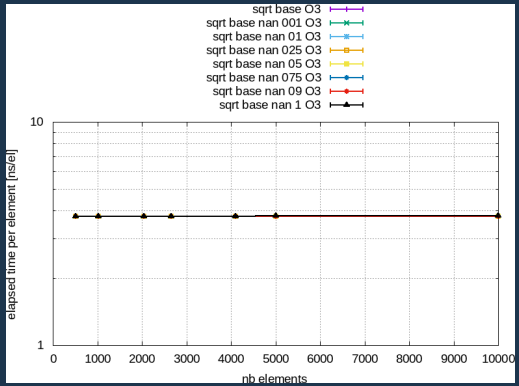


SQRT : NaN Performances

Total Elapsed Time (cy)



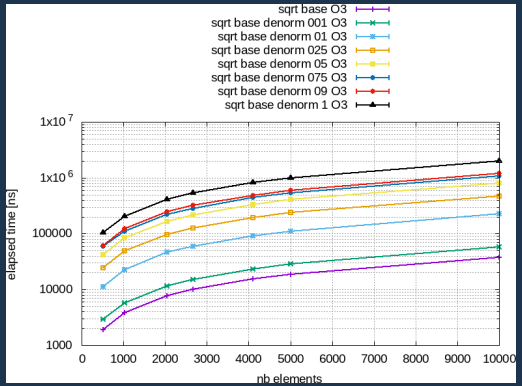
Elapsed Time per element (cy/el)



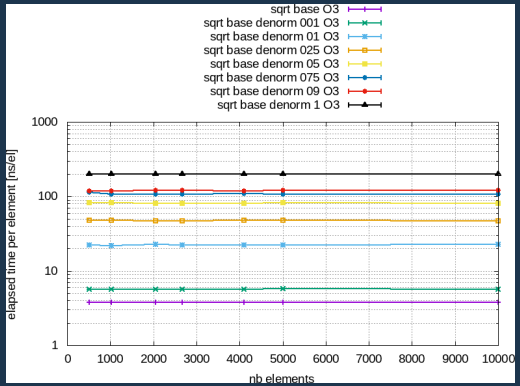
Same performances in **-O3**

SQRT : Denorm Performances

Total Elapsed Time (cy)



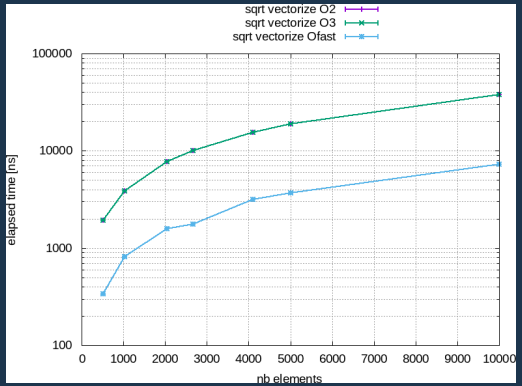
Elapsed Time per element (cy/el)



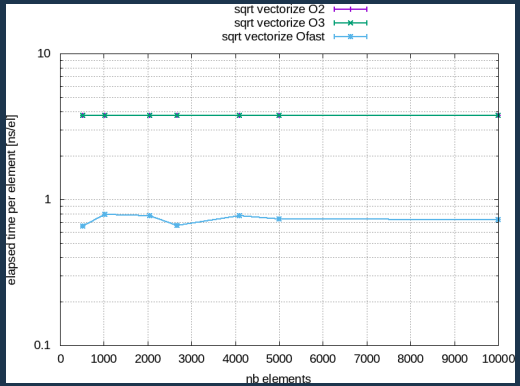
High impact on performances in **-O3**

SQRT : vectorized Performances

Total Elapsed Time (cy)

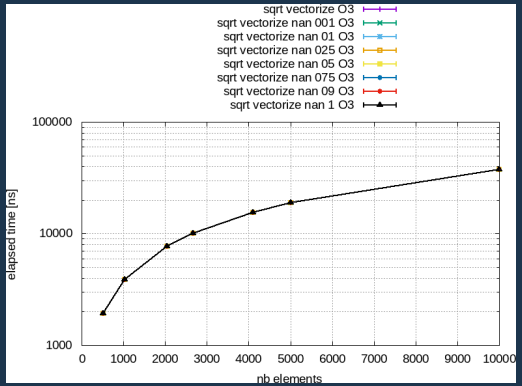


Elapsed Time per element (cy/el)

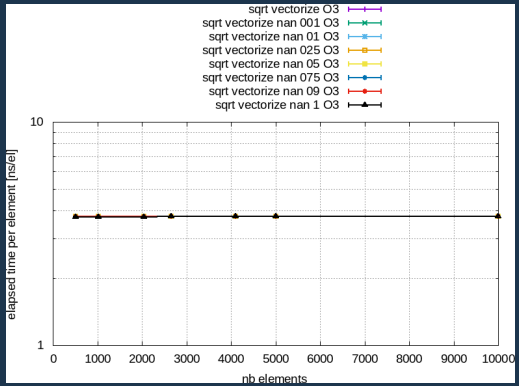


SQRT : vectorized NaN Perf

Total Elapsed Time (cy)



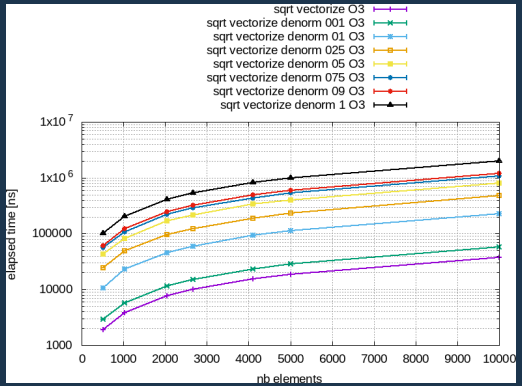
Elapsed Time per element (cy/el)



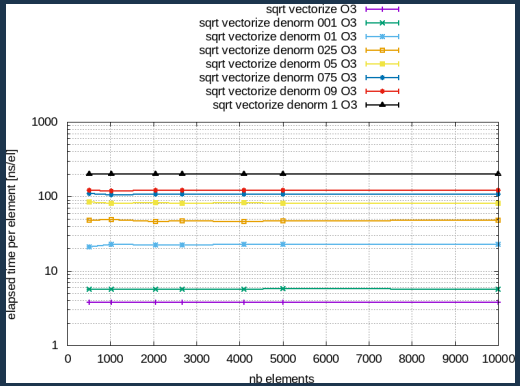
Same performances in **-O3**

SQRT : vectorized Denorm Perf

Total Elapsed Time (cy)



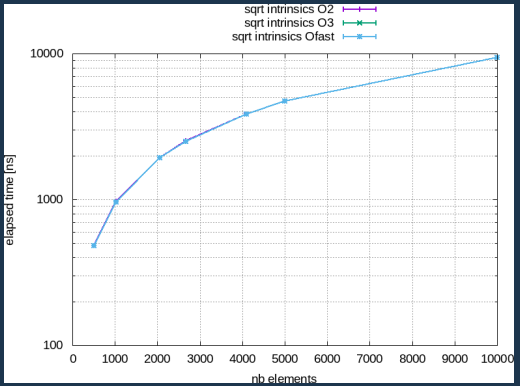
Elapsed Time per element (cy/el)



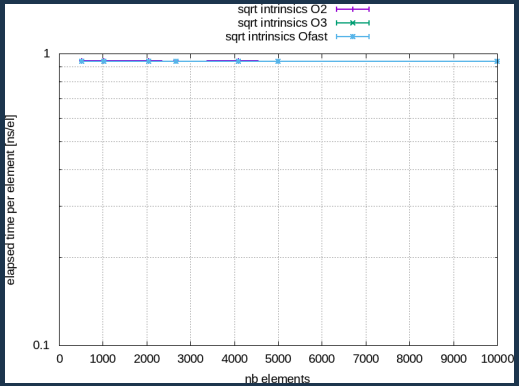
High impact on performances in **-O3**

SQRT : intrinsics Performances

Total Elapsed Time (cy)

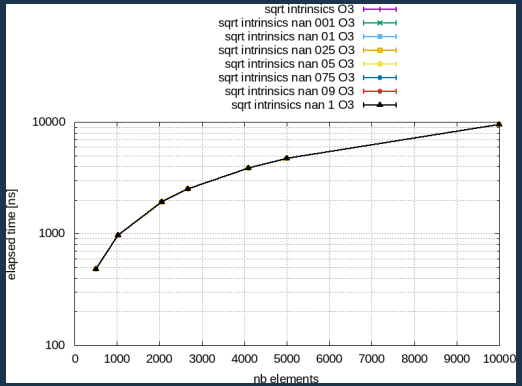


Elapsed Time per element (cy/el)

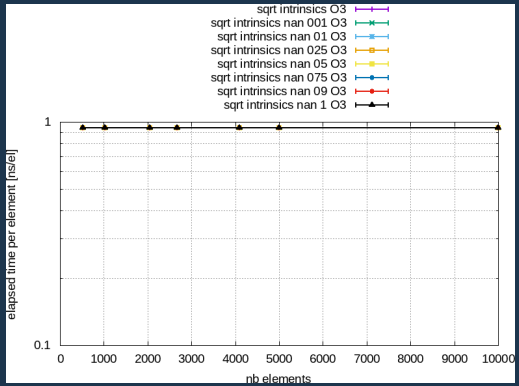


SQRT : intrinsics NaN Perf

Total Elapsed Time (cy)



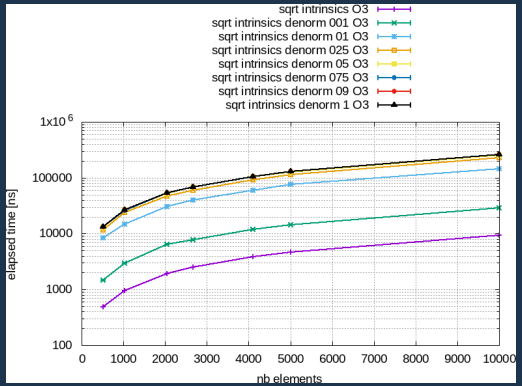
Elapsed Time per element (cy/el)



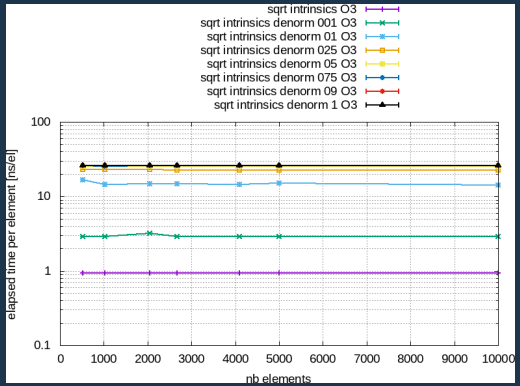
Same performances in **-O3**

SQRT : intrinsics Denorm Perf

Total Elapsed Time (cy)



Elapsed Time per element (cy/el)



High impact on performances in **-O3**

SQRT : Performances summary

NaN values do not slow down the performances

Denormalised values affect a lot the performances :

- 1% : slow down computation by ~ 1.5
- 10% : slow down computation by ~ 5
- 50% : slow down computation by ~ 20
- 90% : slow down computation by ~ 25
- 100% : slow down computation by ~ 50

Denormalised values affect a lot the intrinsics performances :

- 1% : slow down computation by ~ 3
- 10% : slow down computation by ~ 10
- $50 - 100\%$: slow down computation by ~ 25