N-body memory layout exploration

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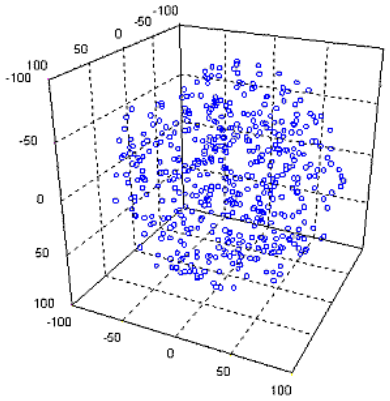
Structure

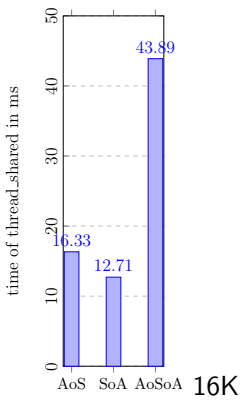
The n-body simulation

- simulate the interaction of n particles
- each particle has
  - position x
  - position y
  - position z
  - velocity x
  - velocity y
  - velocity z
  - mass

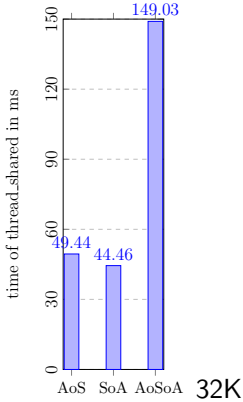


http://astro.dur.ac.uk/~nm/pubhtml/nbody/nbody.html

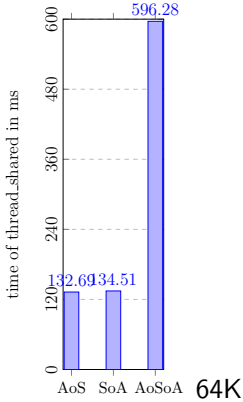
Compare the memory structures - on K80



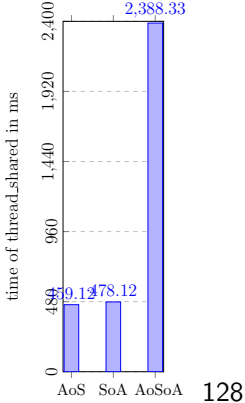
16K



32K

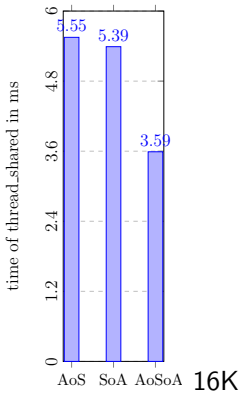


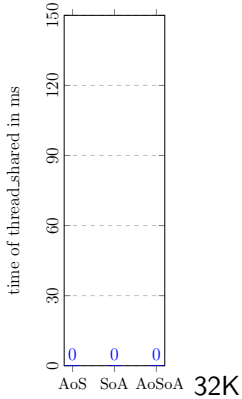
64K

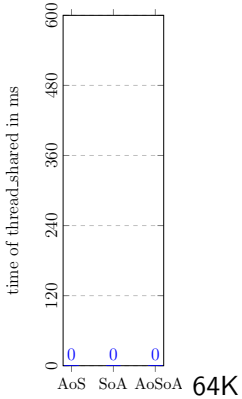


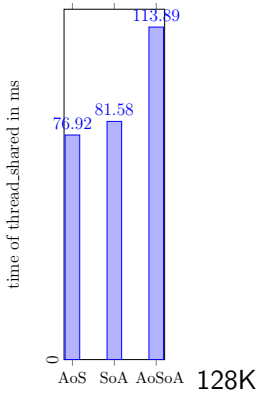
128K

Compare the memory structures - on v100

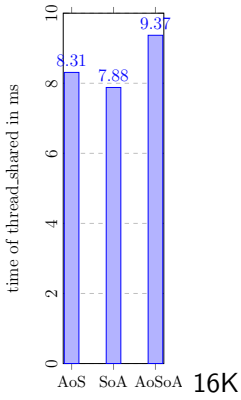


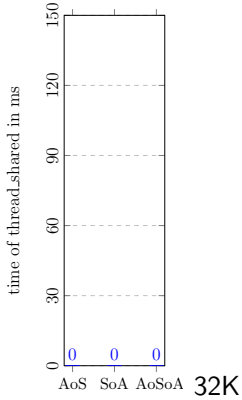


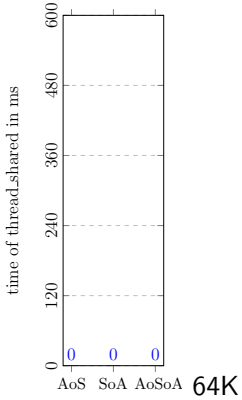


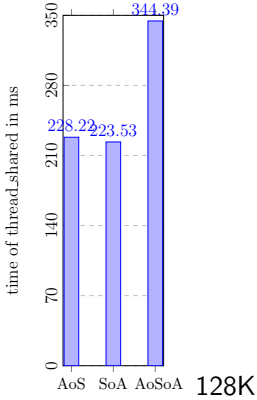


Compare the memory structures - on 1070









Why?

Memory Layout:

- K80 - HBM
- v100 - ...
- 1070 - GDDR