Atom range 0-23000 atom number: 10000 bucket width: 500

brute force: 3.982 quad-tree in cpu: 4.03s quad-tree in gpu: 0.307ms

Atom number :100000 bucket width 1000

quad-tree in cpu: 236s quad-tree in gpu: 9.7s

Atom number :100000 bucket width 500

quad-tree in cpu: 433s quad-tree in gpu: 7.02s