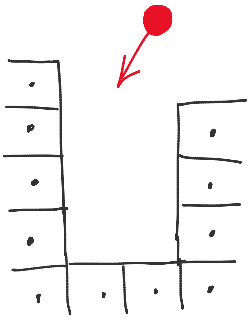
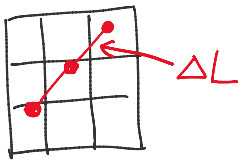
Step Advance

Wednesday, September 2, 2020 3:18 PM

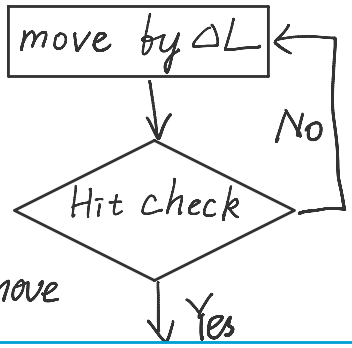
STPE ADVANCE
INFINITE SMALL PTCL

① 



ptcl advances by step ΔL

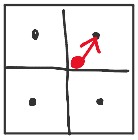
Hit check after each move



Computational Load depends on Mesh Domain

ptcl is always mapped to grids

Vac./Mat. ptcl (x_i, y_i)

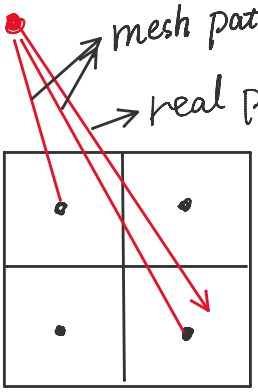


$i = \text{round}\left(x_i/\Delta x\right)$

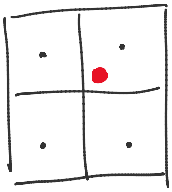
$j = \text{round}\left(y_i/\Delta y\right)$

ptcl hits cell (i, j)

check cell to be vac. or Mat.

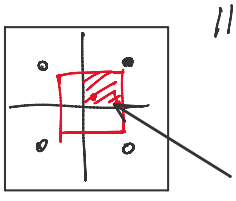


Two views:



i) assume the ptcl is infinite small

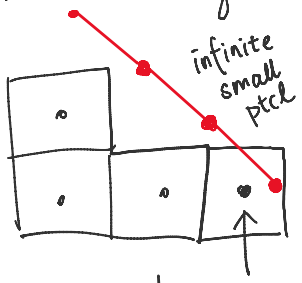
ptcl hits the cell when it enters inside a cell

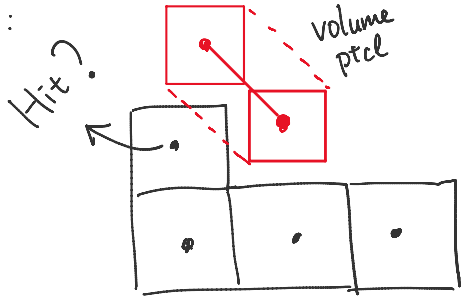


ii) assume ptcl has a volume 

ptcl hits the cell with max volume overlap

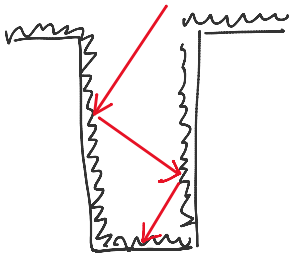
Possible questions:

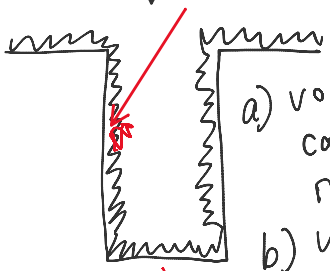




good for rough surf

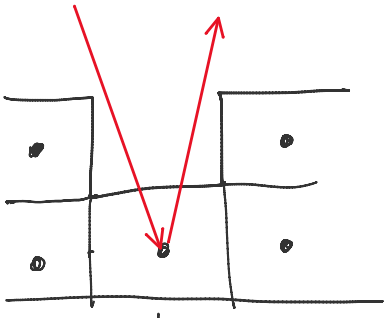
Trapped in rough surf

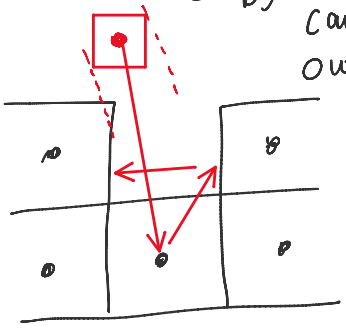




a) volume ptcl cannot reach narrow trench

b) volume ptcl cannot get out of narrow trench





good for penetrating

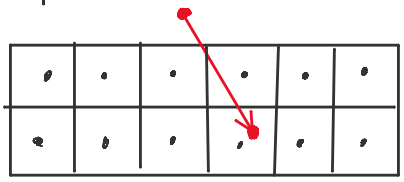
$\Delta L = \Delta L(\varepsilon)$

↓

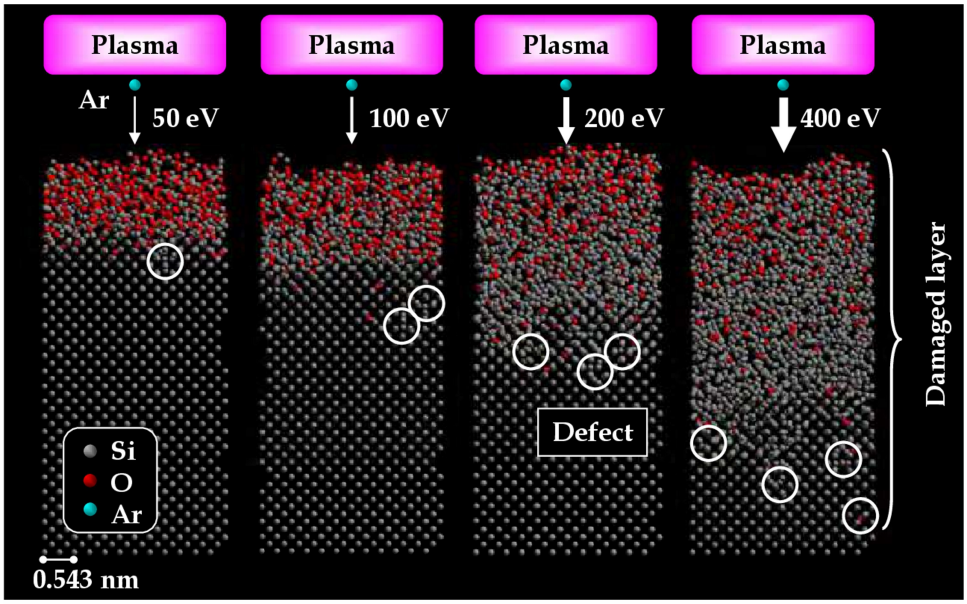
When use larger ΔL

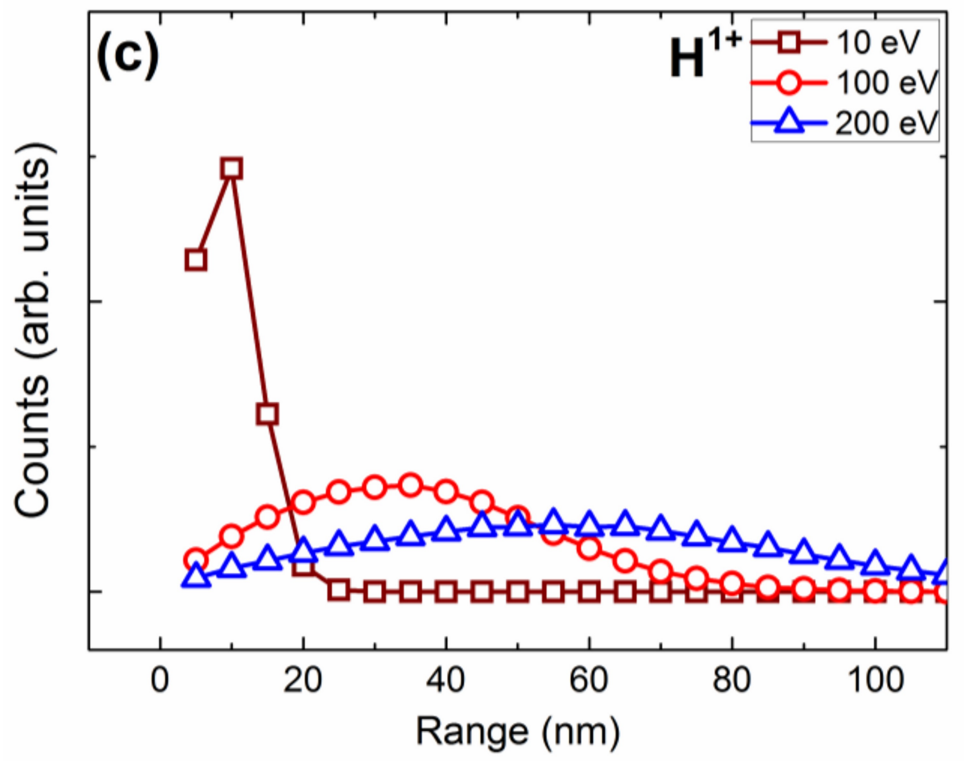
e.g. $\Delta L \approx 2\Delta x$

ptcl able to hit underlying layer



No need concept of SURF


Plasma
Plasma
Plasma
Plasma
Ar
50 eV
100 eV
200 eV
400 eV
Damaged layer
Defect
Si
O
Ar
0.543 nm


(c)
H1+
10 eV
100 eV
200 eV
Counts (arb. units)
0
20
40
60
80
100
Range (nm)