

R : # of particles that can be processed in one processing cycle.  
I: # of processing iterations  
 $R \cdot I = N$

Total seeds: C  
Particles per seed: P  
Total particles:  $N = CP$   
Max Steps: M

Resolution of Sample Space:  $X * Y * Z$   
Number of Samples: S  
Number of Sample Directions: SN  
Total # of Waypoint Masks: W  
Loopcheck Resolution Fraction: L

OciEnv Computes R  
(2R because dual directions)

**2R** x

## Total Unallocated Memory on GPU

### Static Data (CL\_MEM\_READ\_ONLY) (Size)

F Samples (  $X*Y*Z*S*SN*sizeof(cl\_float4)$  )

Theta Samples (  $X*Y*Z*S*SN*sizeof(cl\_float4)$  )

Phi Samples (  $X*Y*Z*S*SN*sizeof(cl\_float4)$  )

Brain Mask (  $X*Y*Z*sizeof(unsigned\ short\ int)$  )

Waypoint Mask(s) (  $W*X*Y*Z*sizeof(unsigned\ short\ int)$  )

Exclusion Mask (  $X*Y*Z*sizeof(unsigned\ short\ int)$  )

Termination Mask (  $X*Y*Z*sizeof(unsigned\ short\ int)$  )

Prefdir (  $X*Y*Z*sizeof(cl\_float4)$  )

### Dynamic Data (CL\_MEM\_WRITE\_ONLY) (Size)\*

Global pdf (  $X*Y*Z*sizeof(unsigned\ int)$  )

### Dynamic Data (CL\_MEM\_READ\_WRITE) (Size)\*

Particle Paths (  $M*sizeof(cl\_float4)$  ) (OPTIONAL)

Individual pdf (  $X*Y*Z*sizeof(unsigned\ int)/32$  (binary mask)

Particle Loopcheck (  $X*Y*Z*sizeof(cl\_float4)/(125)$  )

Waypoint Mask Check (  $W*sizeof(unsigned\ short\ int)$  )

Struct Particle (  $8*sizeof(ulong) + 2*4*sizeof(float)$  )

Particle Done (  $1*sizeof(unsigned\ short\ int)$  )

\*per particle