

New particle with  
weight  $w = w_0$

**Loop I**  
Exospheric Particle Transport  
and Surface Interactions

Launch particle at  $\vartheta_0, \varphi_0$   
with  $\mathbf{v} \sim V_{\text{MBF}}$

$$n_0 \mapsto n_0 + \frac{w}{Av}$$

Calculate landing  
position  $\vartheta_1, \varphi_1$   
and time-of-flight  $t_f$

$$v \geq v_{\text{esc}}$$

escape

update  $w$

Landing at  $\vartheta_1, \varphi_1$

$$n_0 \mapsto n_0 + \frac{w}{Av}$$

Surface interactions  
at  $\vartheta_1, \varphi_1$

cold  
trapping

thermal desorption; photodesorption; sputtering

update  $w$

store converted  
particles for  
next iteration

photo-  
dissociation

(sub-) surface  
reaction

adsorbate  
photodissociation