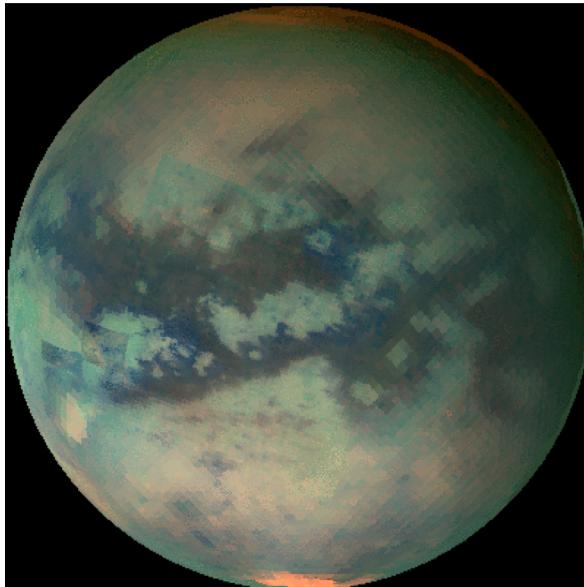


Monte Carlo simulations on the H_2 exosphere of Titan

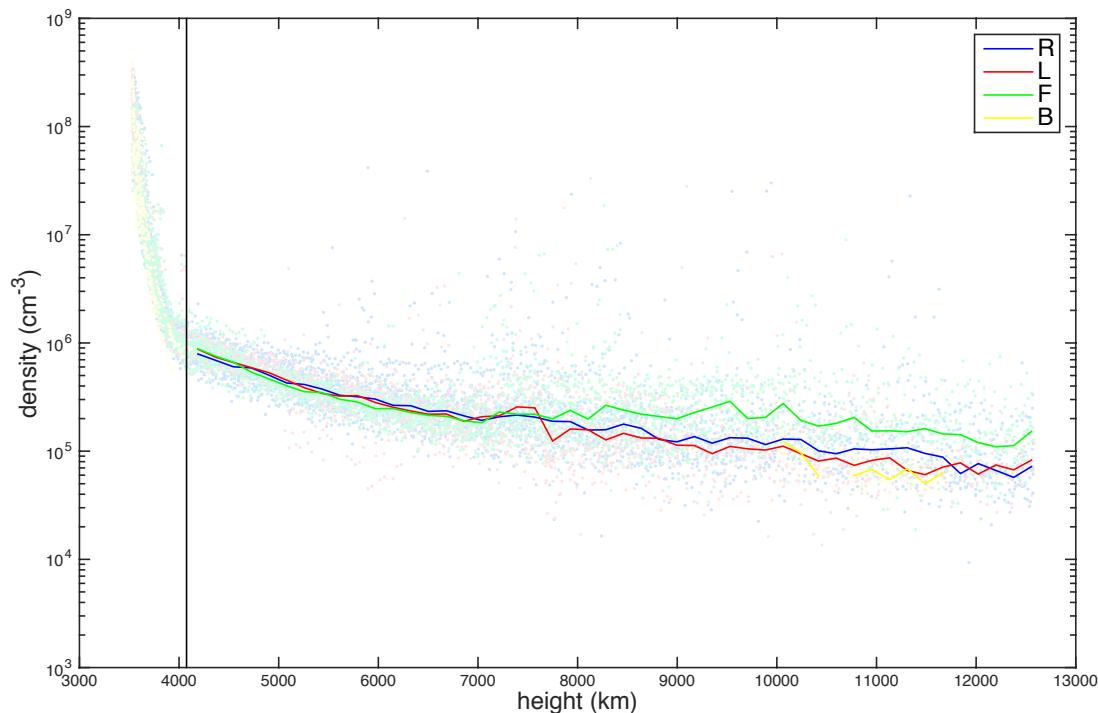
Background

- Titan: The largest moon of Saturn.
- Cassini–Huygens
- Ion and Neutral Mass Spectrometer (INMS)

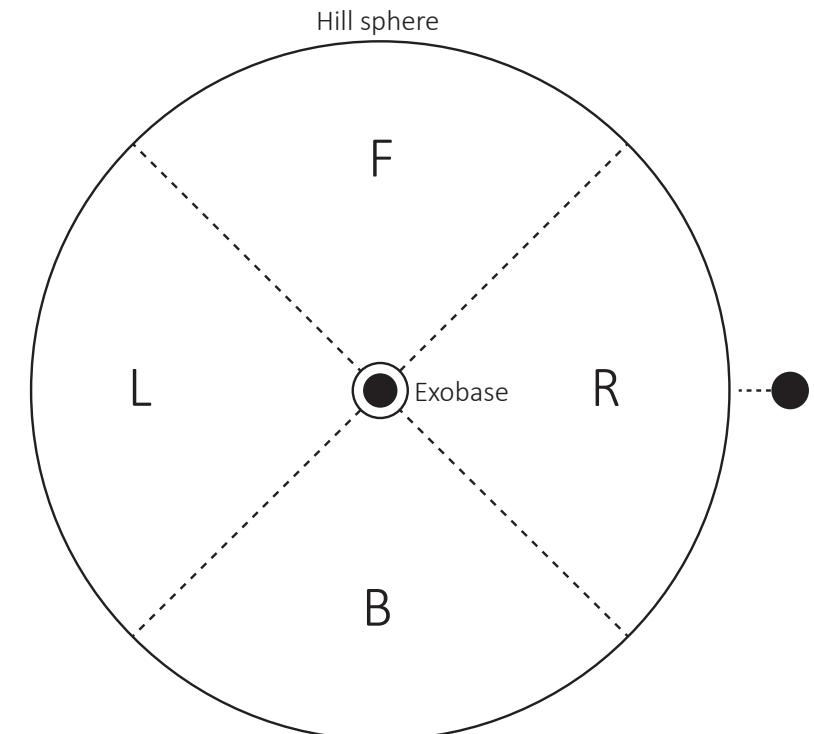


H_2 exosphere of Titan

- Exosphere: Gravitationally bound; Collision-free.
- Exobase: The lower boundary of the exosphere

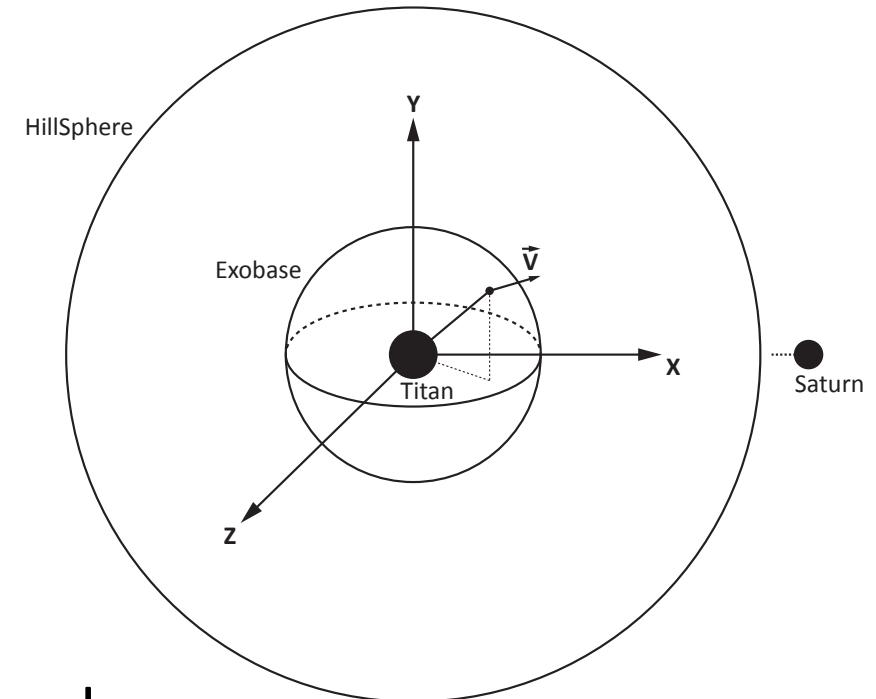


The H_2 exosphere of Titan (Cassini data)(INMS)

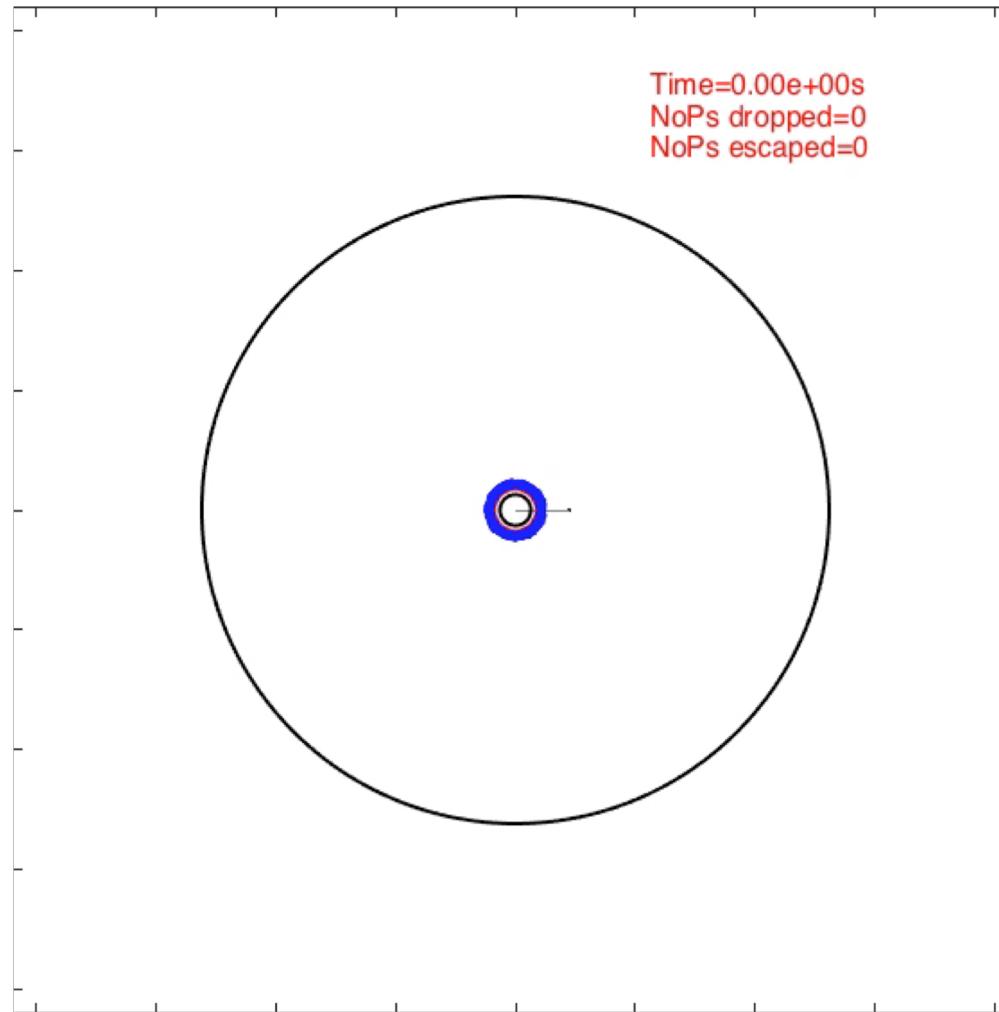


Model

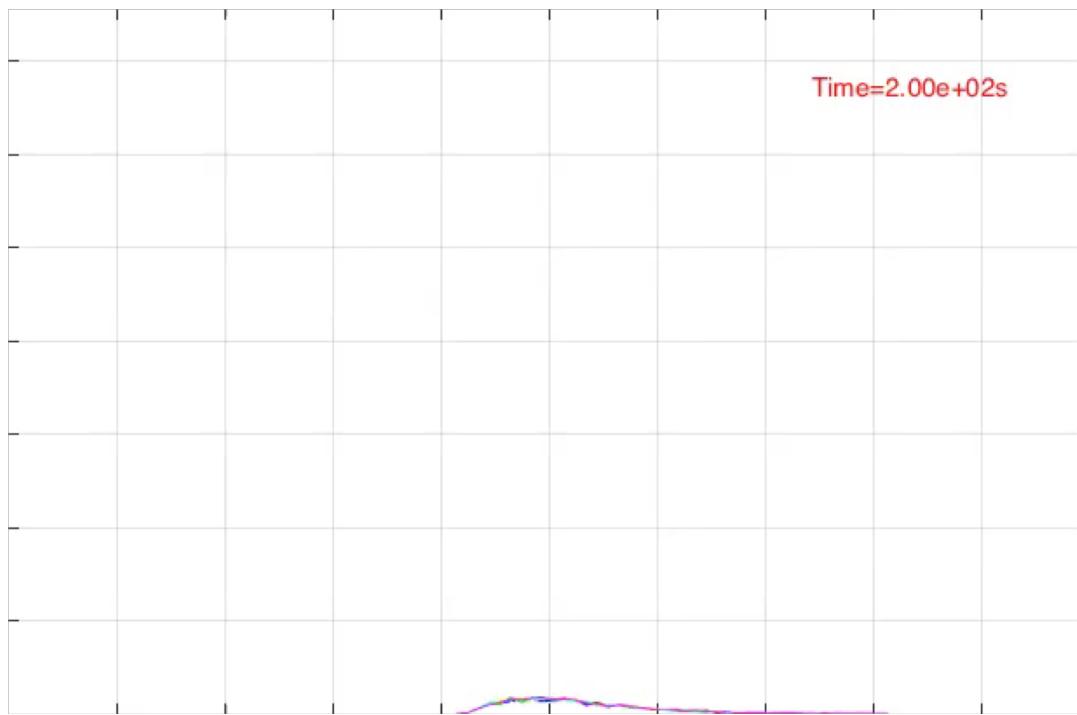
- Titan & Saturn: A restricted 3-body problem
Runge–Kutta–Fehlberg method (RKF)
- Inner boundary: Exobase
- Outer boundary: Hill sphere
- Initial conditions: $2(\theta, \varphi) + 3(v_x, v_y, v_z)$ random numbers
 - Maxwell Distribution
 - ← Gaussian Distribution (3 components)
 - ← Uniform distribution (Box-Muller transform)
- Wind: 100 m/s at the equator



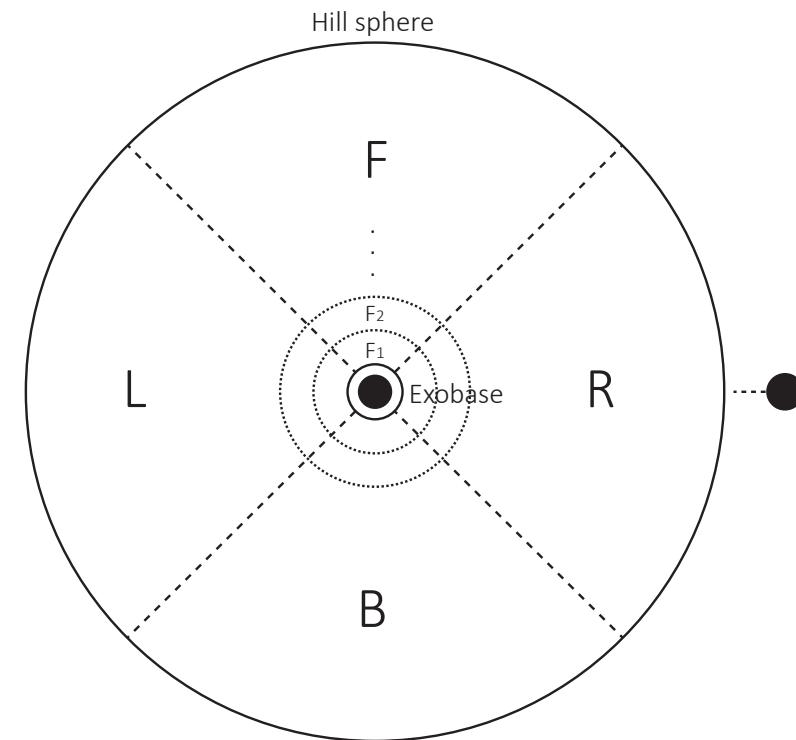
Simulation results



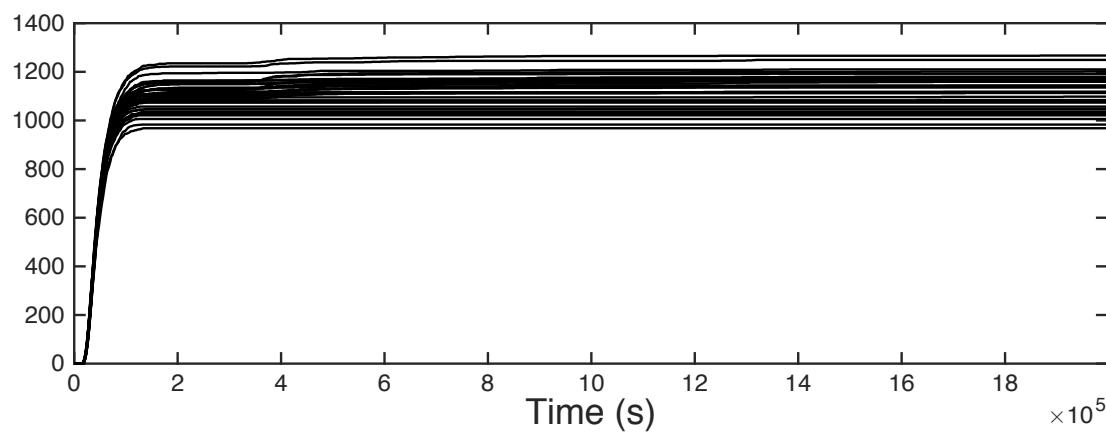
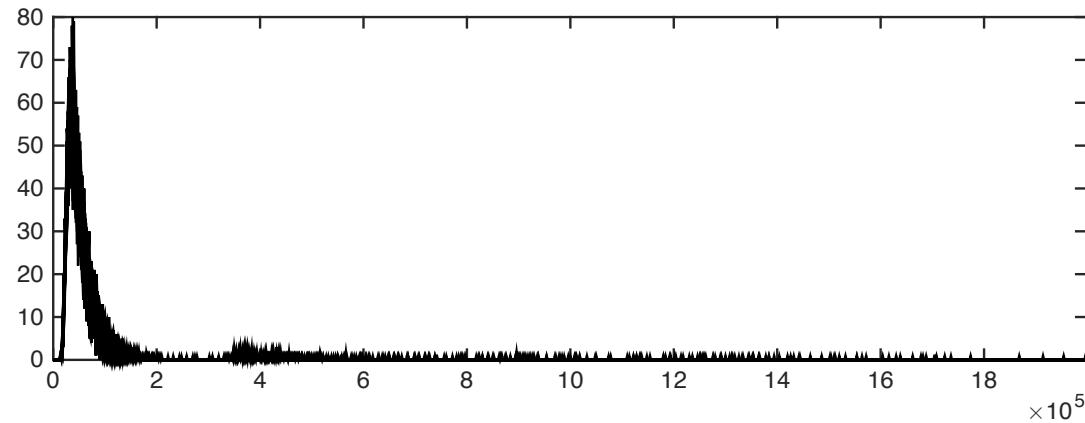
Velocity distribution



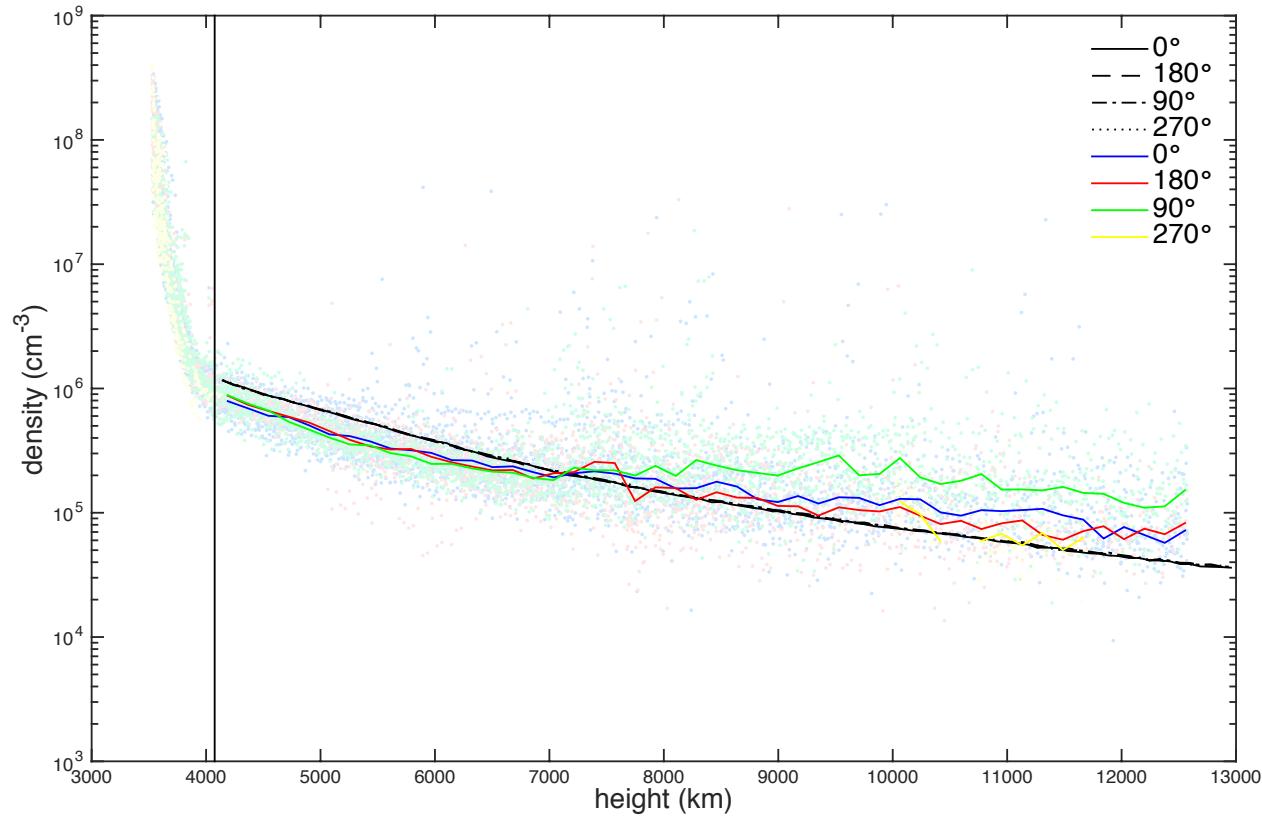
Velocity



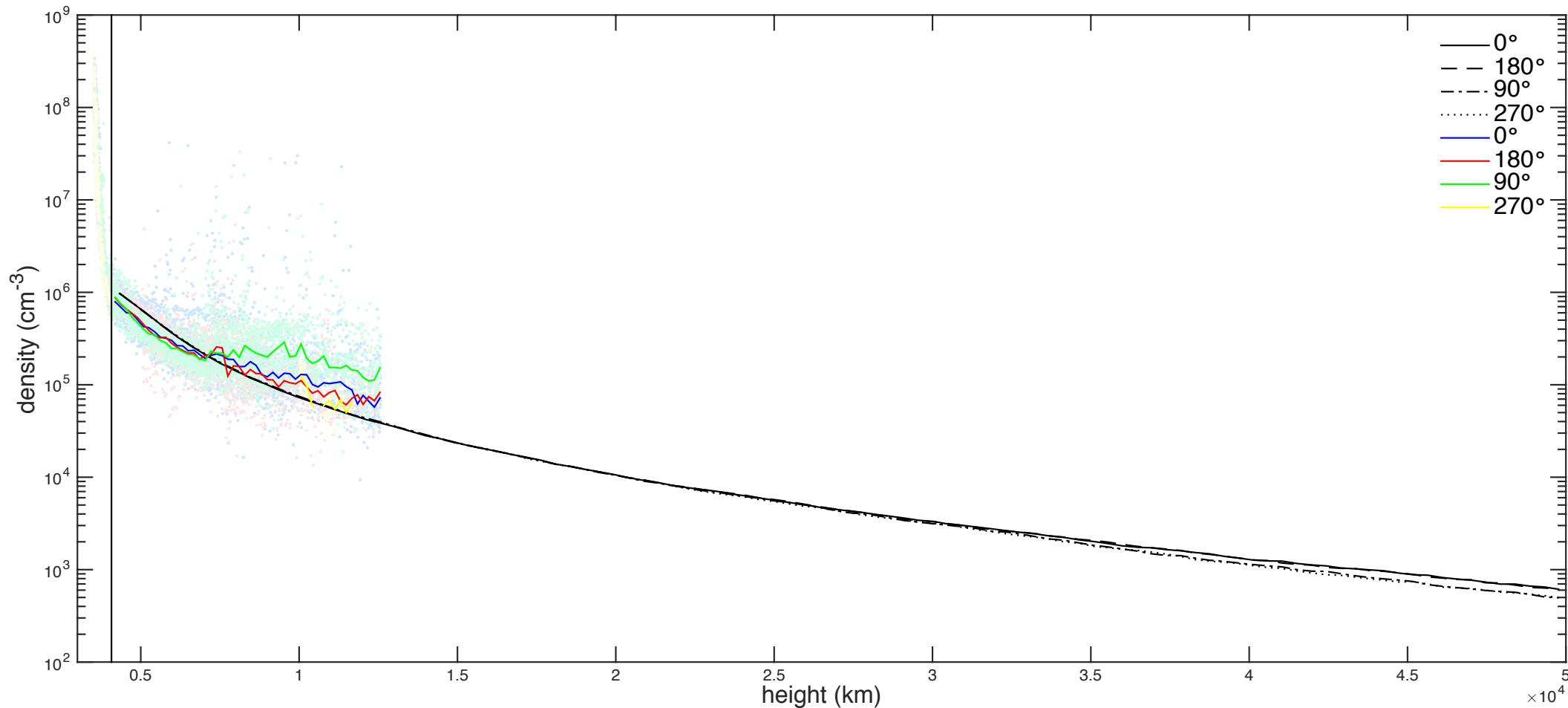
Continuous flux



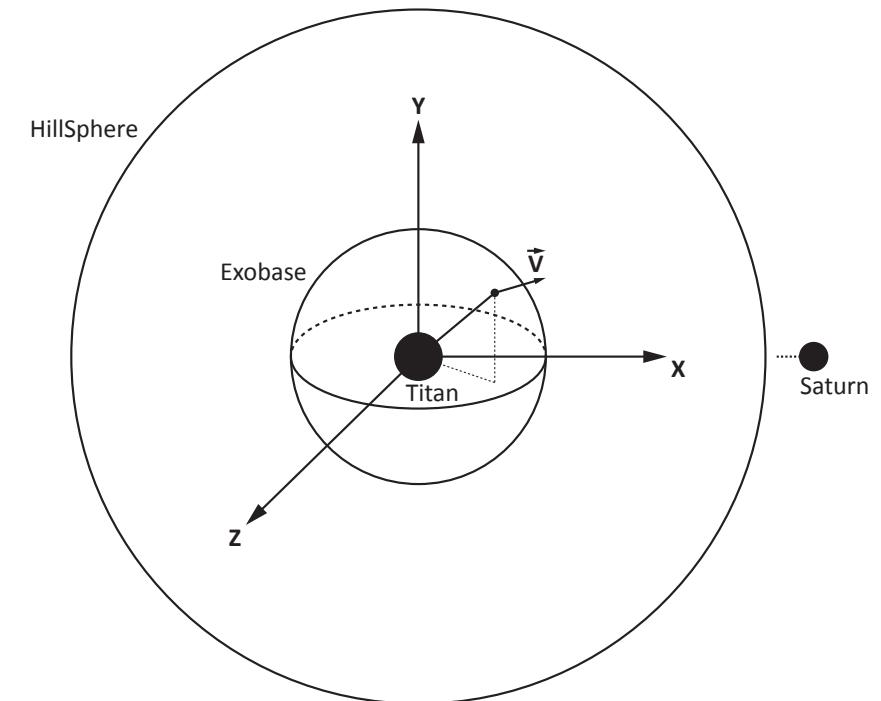
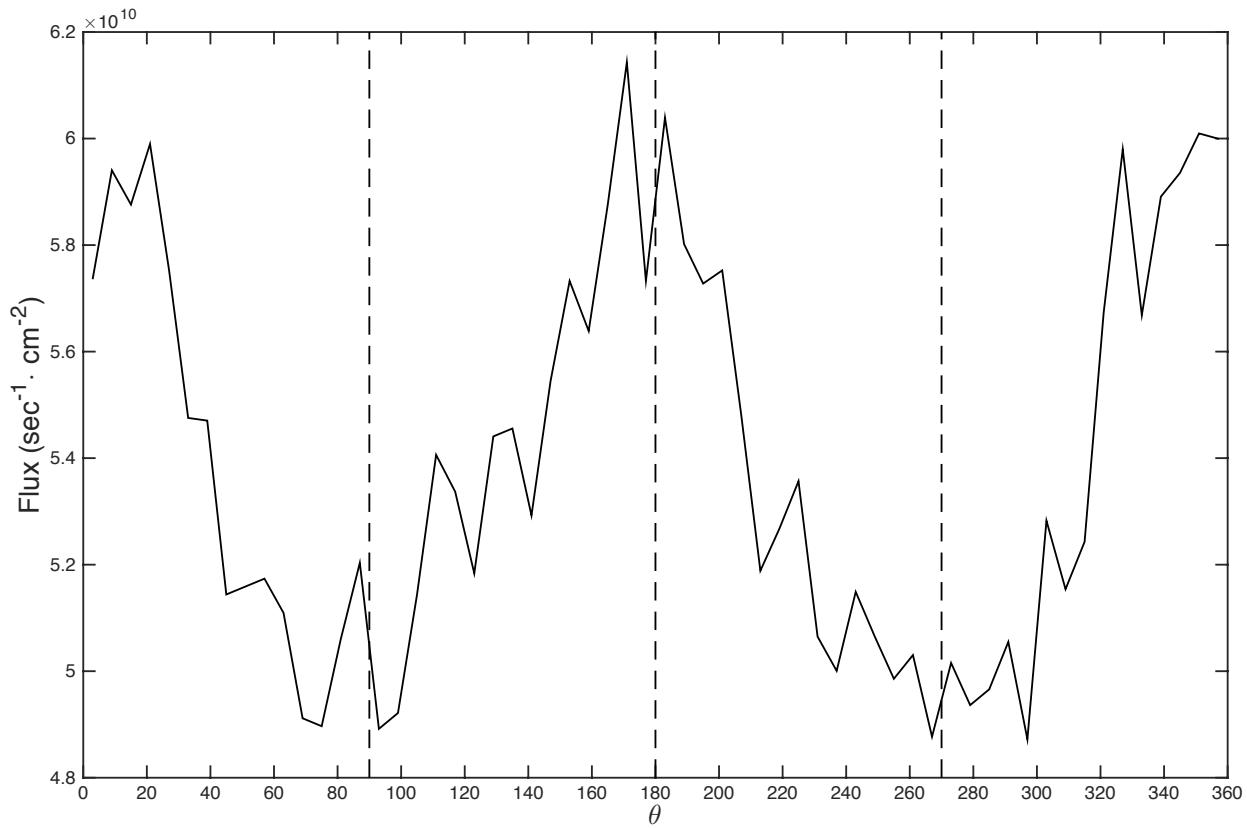
Density



Density



Escape flux



The end