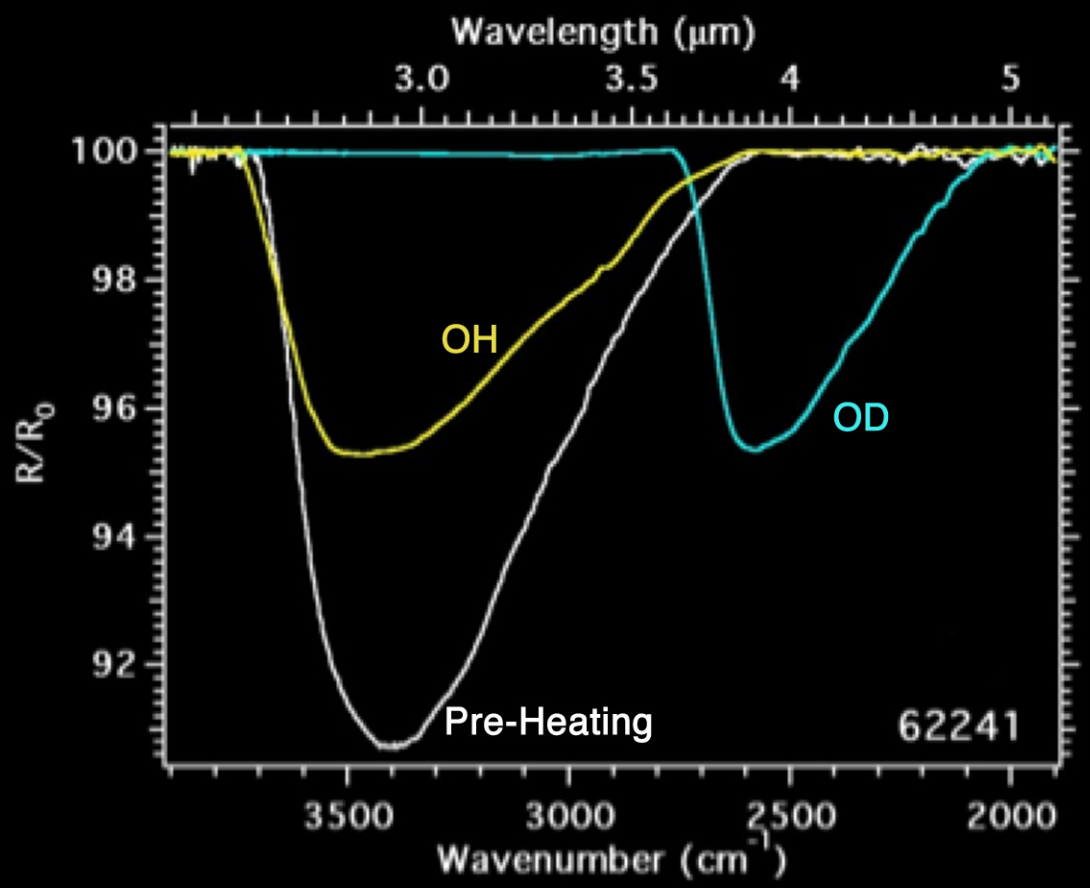
Solar wind as source of lunar H

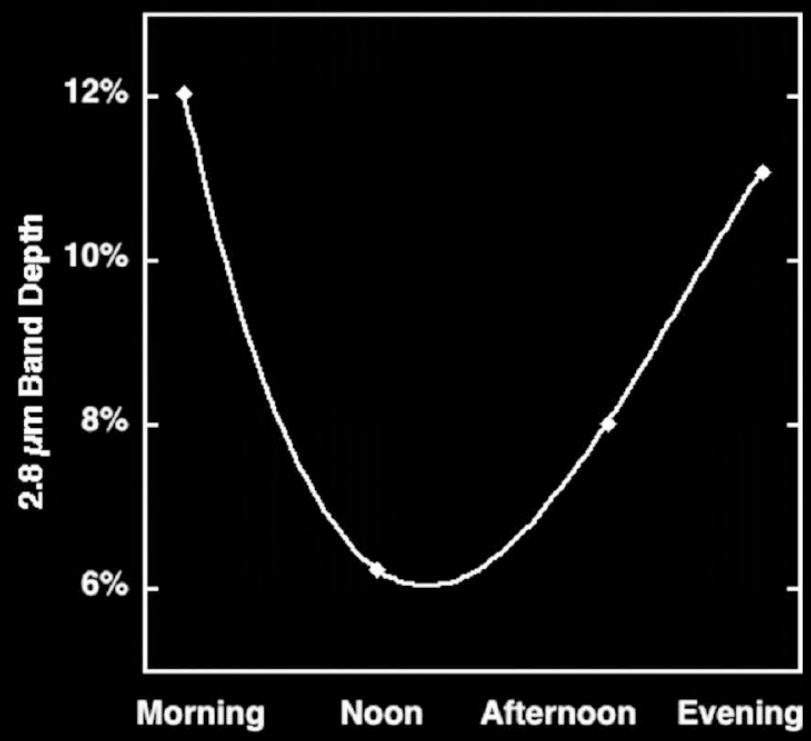
Ichimura *et al., EPSL,* Hydroxyl (OH) production on airless planetary bodies: Evidence from H^+/D^+ ion-beam experiments, 2012

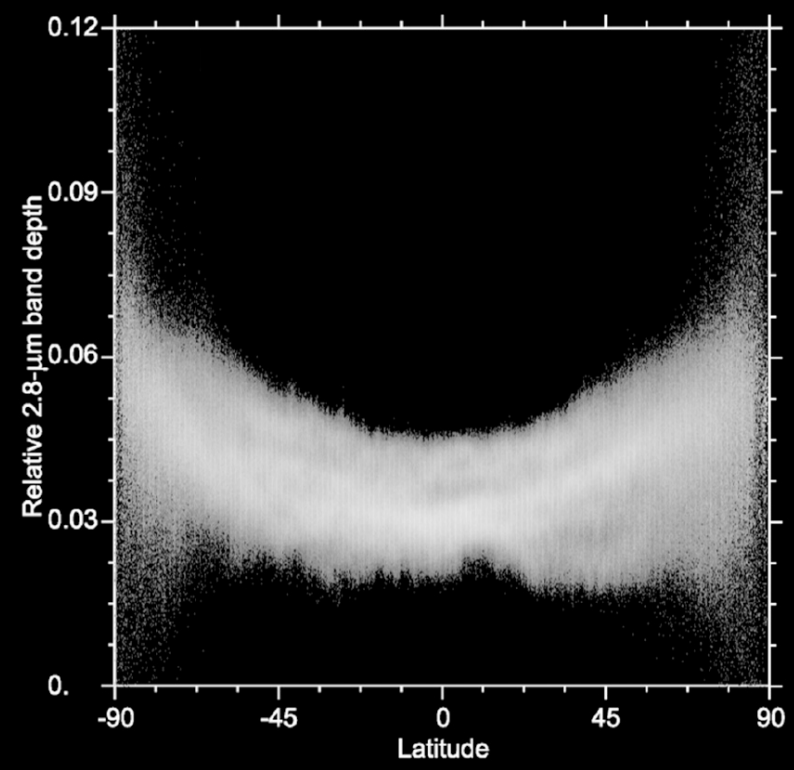


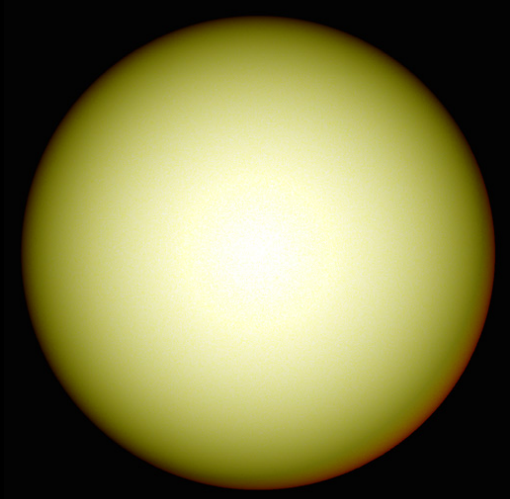
Observed distribution of H

Effectively mirror image of production functions

Reflects not source but transport mechanism



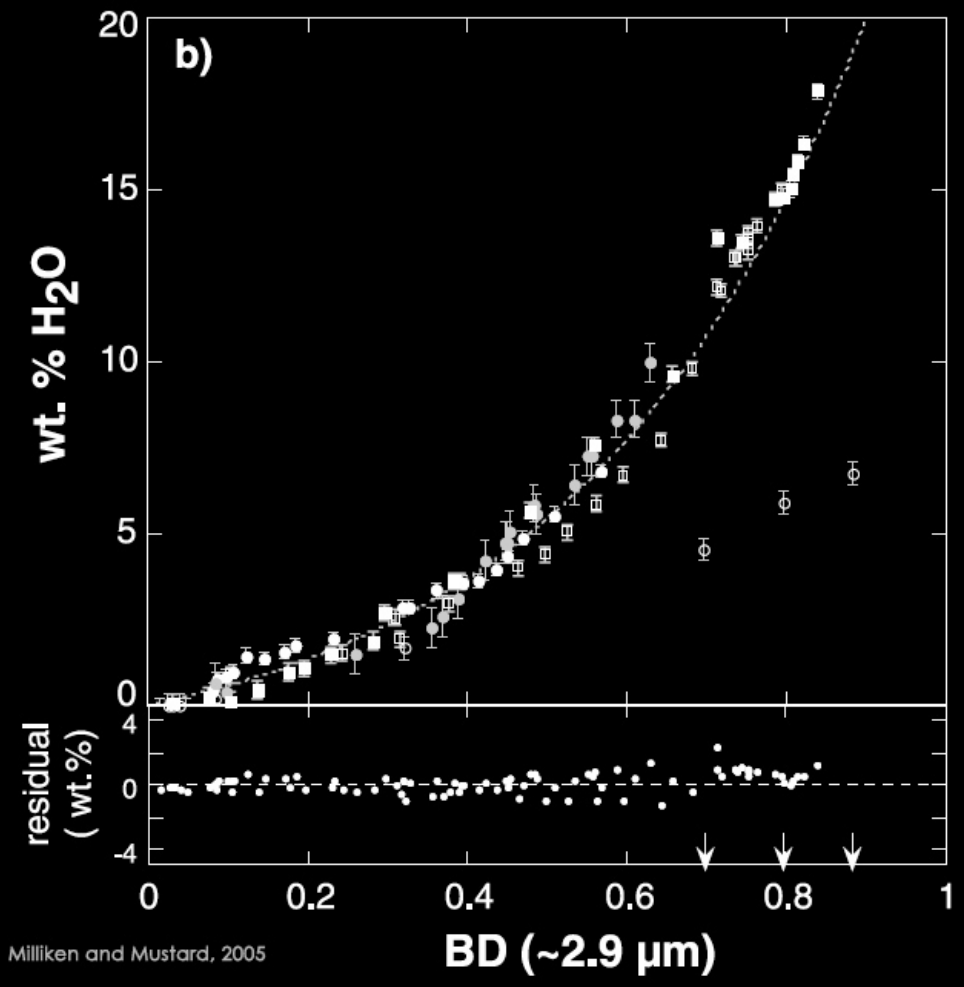




Band Depth - 2.8 – 3 microns.

Relatable to wt% absorber

At small band depth ~ linear



Milliken and Mustard, 2005

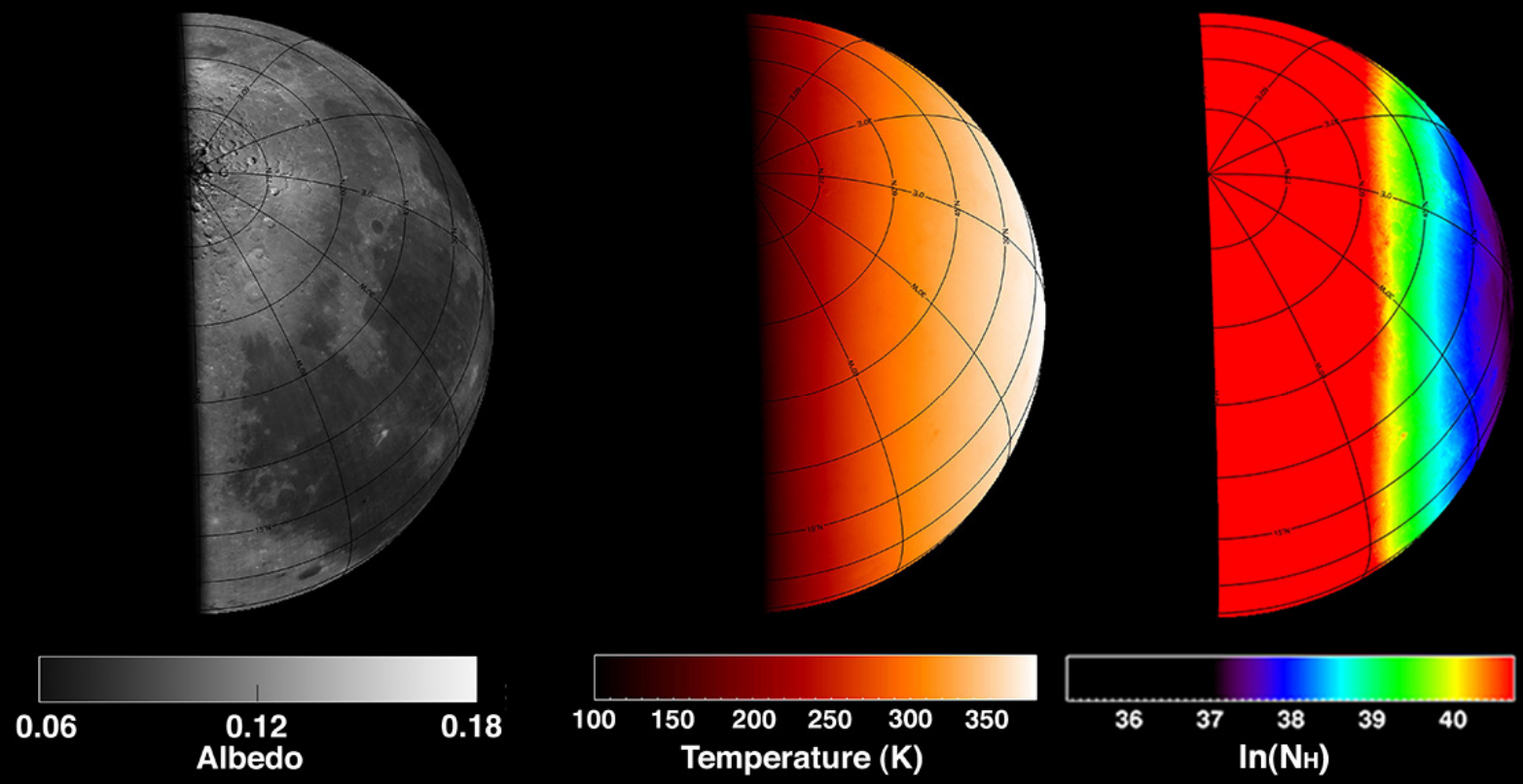
Can a simple model begin to reproduce the observations?

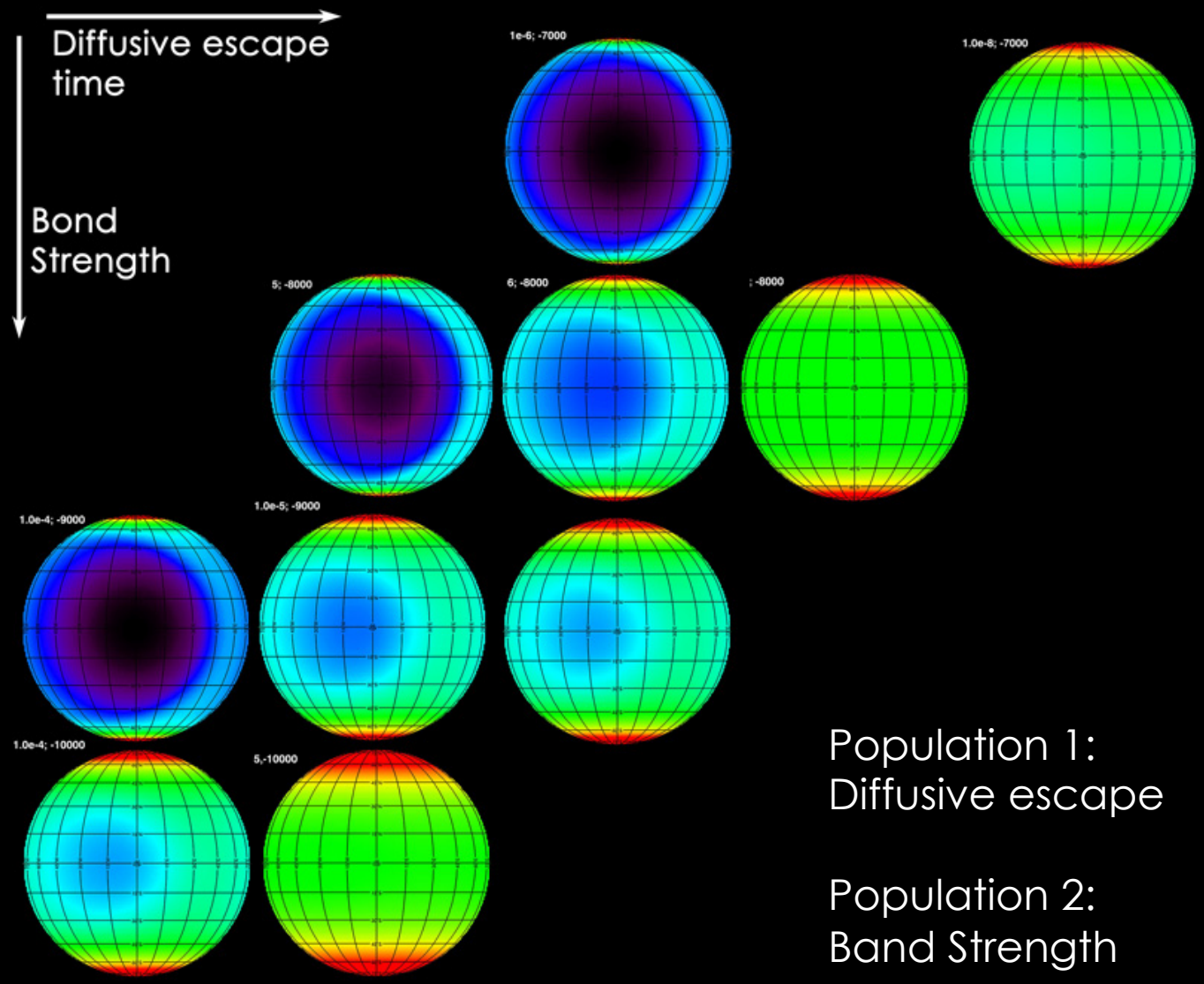
$$T = \sqrt[4]{S(1-A)/\varepsilon\sigma}$$

2 Populations:

1. Solar Wind
2. Ballistic

$$n = j_1\tau_1 + j_2\tau_2$$





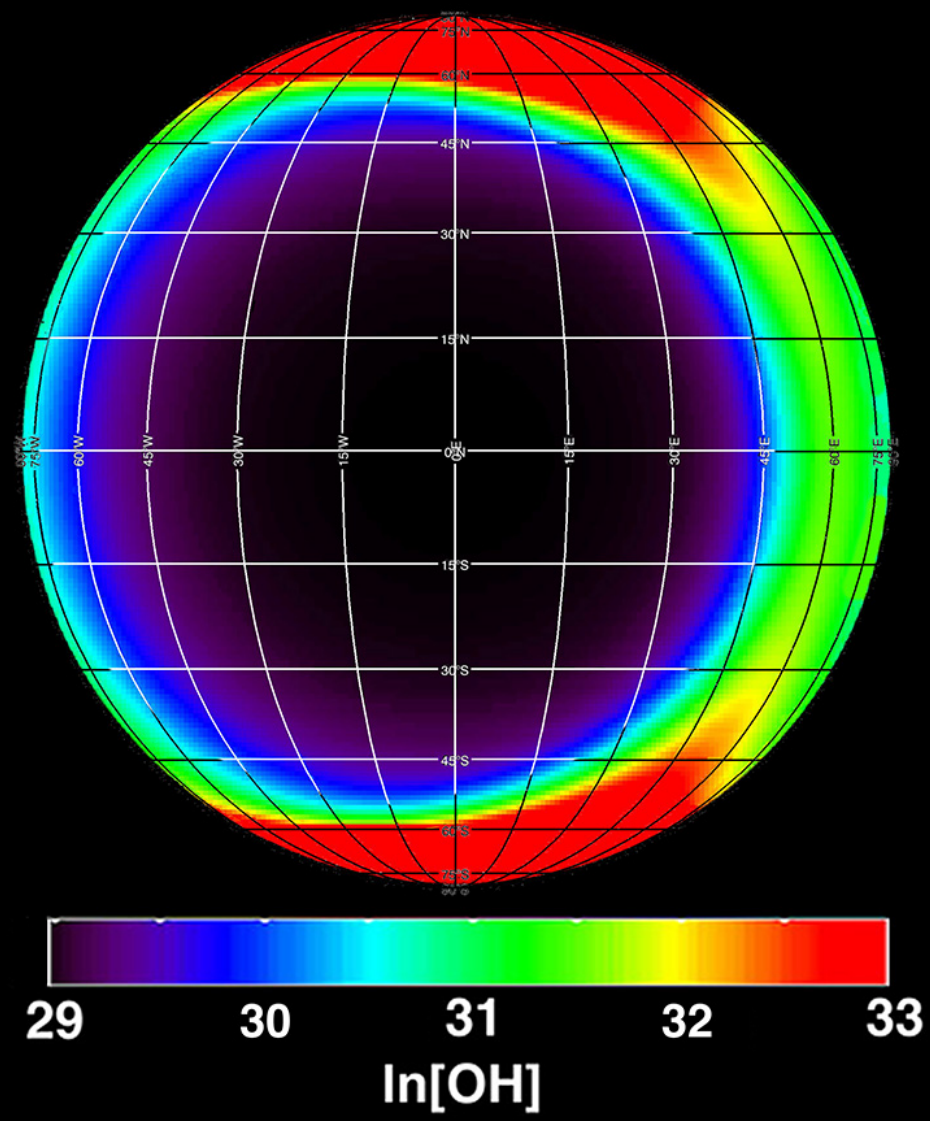
Population 1:
Diffusive escape

Population 2:
Band Strength

For hour angle signature > 0

$n_2 > n_1$

Flux to poles very high

Work to Go:

1. Rigorous band depth – hour angle
2. Quantitative band depth - wt% relation