

## MODTRAN Climate models online

A relatively simple software model built years ago for the Air Force, available to anyone free online.

You can plug in your own numbers for things like CO<sub>2</sub> and humidity and see what happens in seconds.

**MODTRAN** stands for **MOD**erate resolution atmospheric **TRAN**smission.

Purely optional, of course, but it may give you a feel for how the atmosphere works.

Two places where free on-line implementations are available:

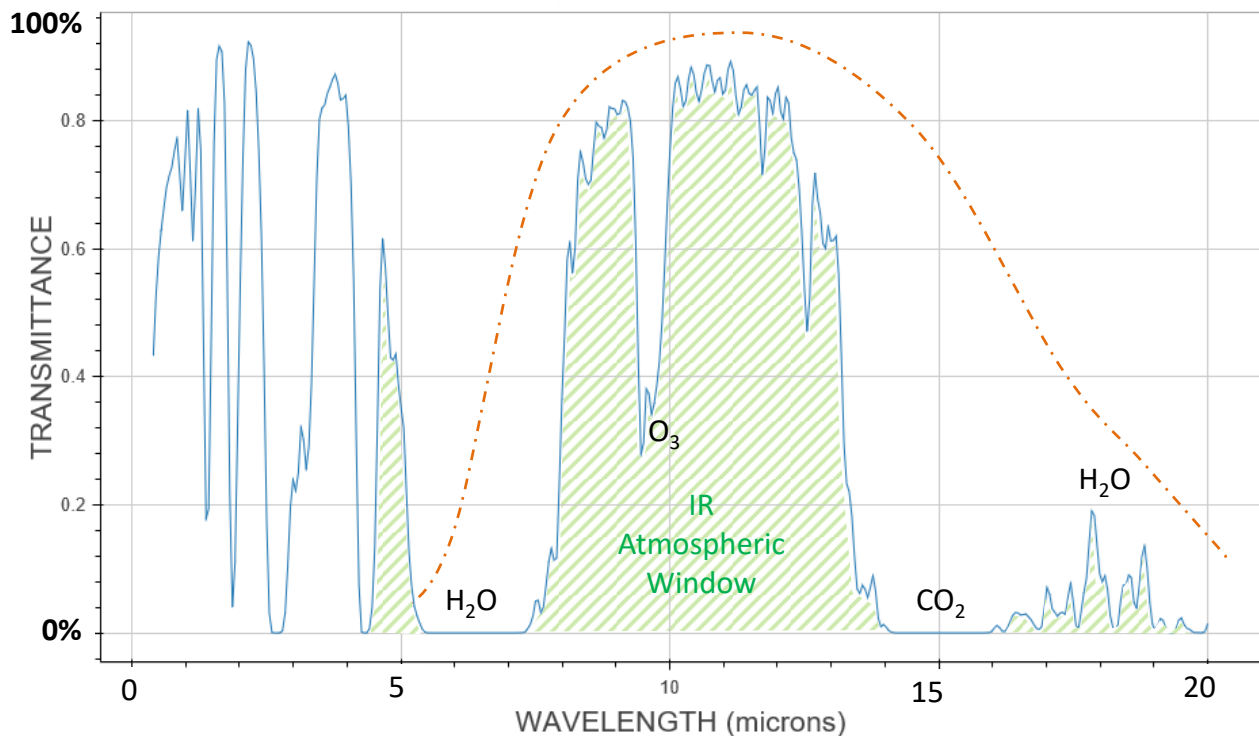
1. **For simple Atmospheric Transmission** – calculating how much Infrared radiation passes through the full atmosphere from surface to space when you change the gases.

[http://modtran.spectral.com/modtran\\_home](http://modtran.spectral.com/modtran_home)

Hint: Be sure to move **Spectral Range** slider all the way over to 20 microns.

## MODTRAN Atmosphere Transmission Model

All Gases Included: H<sub>2</sub>O, CO<sub>2</sub>, O<sub>3</sub>, CH<sub>4</sub>, N<sub>2</sub>O



2. For calculating **IR Radiation amounts going up or down at different altitudes:**

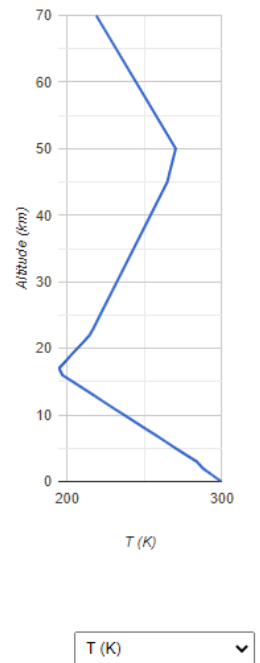
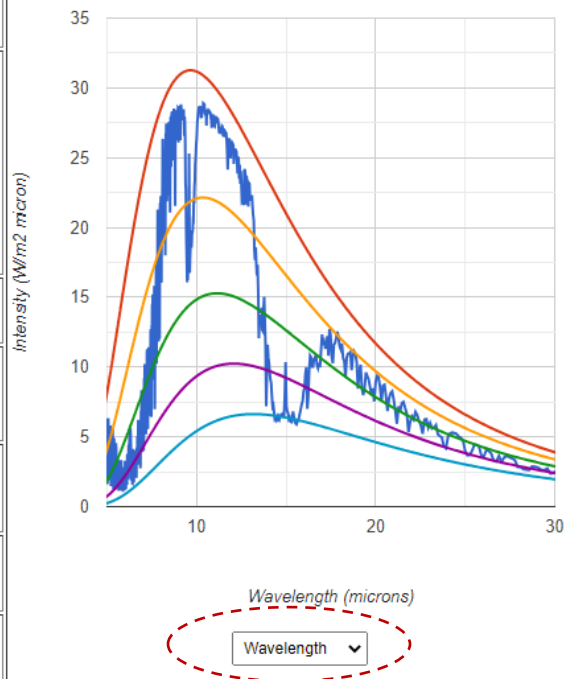
This is hosted by the University of Chicago.

You can specify the surface temperature, atmosphere composition, etc. and see how much IR escapes to space -- or how much reaches any specified altitude, upward or downward.

<http://ClimateModels.uchicago.edu/modtran/>

Hint: You may want to change Wavenumber to **Wavelength** using the dropdown list.

Model Input	
CO <sub>2</sub> (ppm)	<input type="text" value="400"/>
CH <sub>4</sub> (ppm)	<input type="text" value="1.7"/>
Trop. Ozone (ppb)	<input type="text" value="28"/>
Strat. Ozone scale	<input type="text" value="1"/>
Water Vapor Scale	<input type="text" value="1"/>
Freon Scale	<input type="text" value="1"/>
Temperature Offset, C	<input type="text" value="0"/>
Locality	<input type="text" value="Tropical Atmosphere"/>
	<input type="text" value="No Clouds or Rain"/>
Altitude (km)	<input type="text" value="70"/>
	<input type="text" value="Looking down"/>
<input type="button" value="Save This Run to Background"/>	
<input type="button" value="Show Raw Model Output"/>	
Model Output	
Upward IR Heat Flux	<b>298.52 W/m<sup>2</sup></b>
Ground Temperature	<b>299.7 K</b>
<small>Spectrum expanded 5-11-17, changing the IR out value.</small>	



**Note:** There are also many other interesting Climate models available at [www.ClimateModels.uchicago.edu](http://www.ClimateModels.uchicago.edu)