

Atmos. Chem. Lecture 6, 9/23/13: Atmospheric radiation, pressure, and temperature

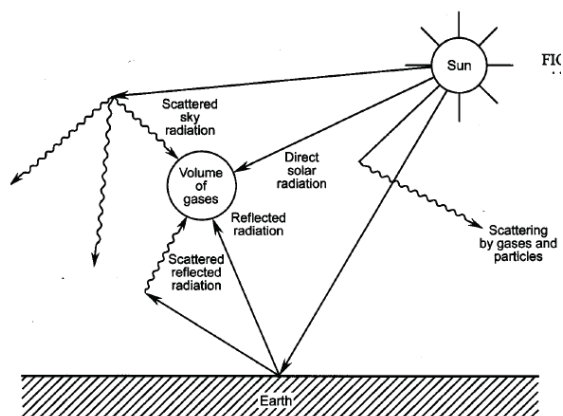
Jaclyn: large-scale field campaigns

Key atmospheric factors that influence reactivity:

- Atmospheric radiation
- Pressure
- Temperature

Lower atmospheric structure: troposphere, stratosphere

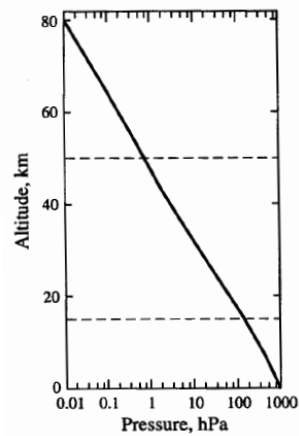
Actinic flux $I(\lambda)$



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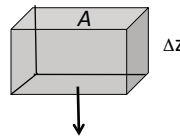
see FP&P for detailed discussion of the role of different factors governing I
(and sample I values)

Pressure as a function of altitude



$$1 \text{ atm} = 760 \text{ mm Hg} = 760 \text{ Torr}$$

$$= 101,325 \text{ Pa} = 1.01325 \text{ bar} = 14.696 \text{ psi}$$



[Note: Additional material is discussed here during lecture.]

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Jacob

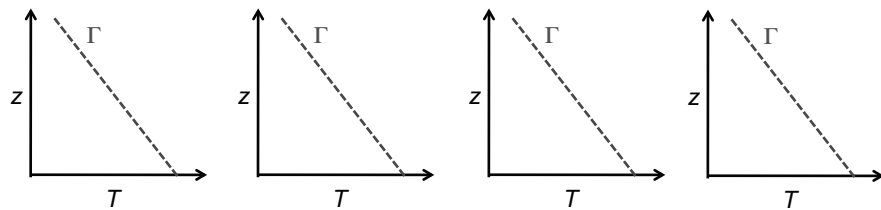
Temperature as a function of altitude

How does the T of an air parcel change as it rises adiabatically (no exchange of heat with its surroundings)?

$$dU = dq + dw$$

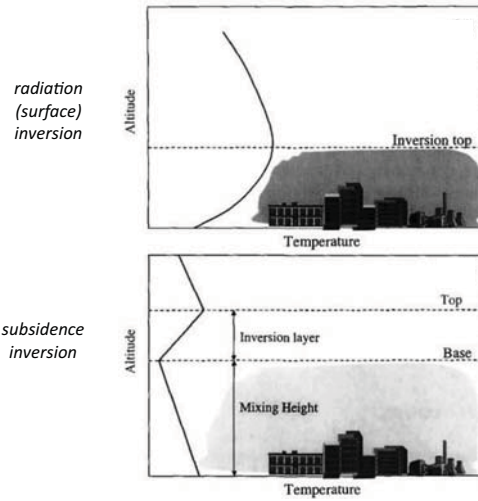
[Note: Additional material is discussed here during lecture.]

Atmospheric stability



[Note: Additional material is discussed here during lecture.]

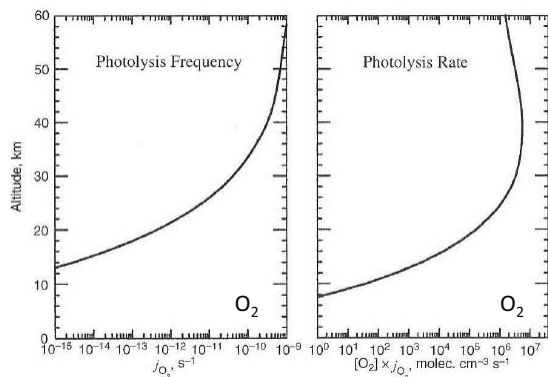
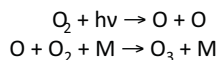
Temperature inversions



S&P

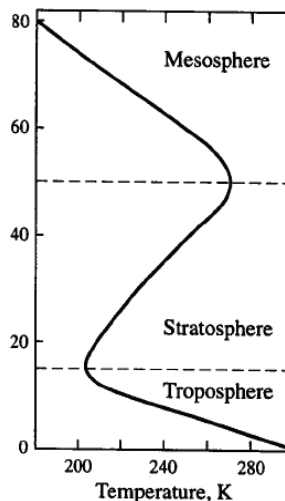
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Putting it all together: light, pressure, temperature



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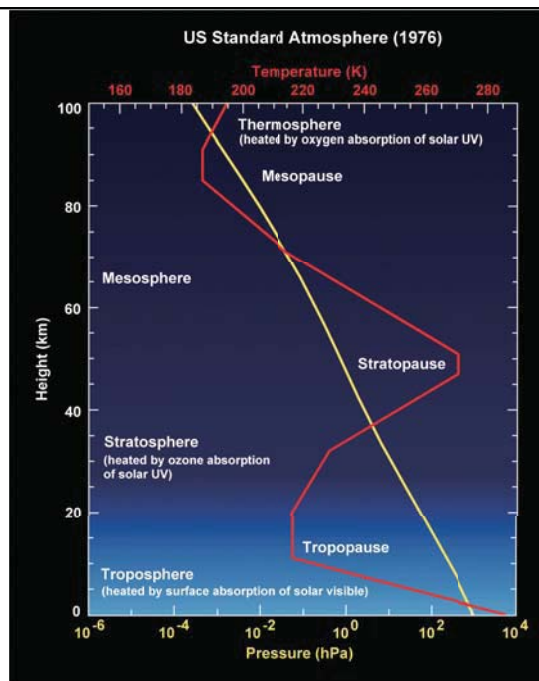
S&P



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Jacob

U.S. Standard Atmosphere (1976)



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1.84J / 10.817J / 12.807J Atmospheric Chemistry
Fall 2013

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