

Meteorology 3510
Exercise #5
Due Thursday, February 14, 2008

This exercise deals with moisture variables and dry adiabatic processes. Use colored pencils. You may write a program to do the calculations.

- Calculate the quantities in the table below (or on the larger version on the next page) for a parcel that ascends dryadiabatically from $p = 1000$ mb, where $T = 20$ °C and relative humidity = 50%, to $p = 850$ mb.

p (mb)	RH (%)	e (mb)	e_s (mb)	w (g/kg)	w_s (g/kg)	θ (K)	T (K)	T_d (K)	T_v (K)
850									
875									
900									
925									
950									
975									
1000	50						293.15		

- On the accompanying graph, plot the quantities from your table.
 - Relative humidity (black).
 - e (red), e_s (blue).
 - w (red), w_s (blue).
 - θ (green), T (red), T_d (blue).
 - T_v (brown).
- Determine the *saturation pressure* (the pressure at the LCL=lifting condensation level) to the nearest mb.

100

700

800

500

P
(mb)

900

700

1000

800

R.H.
 e, e_s
(mb) w, w_s
(g/kg) T, T_d, θ
(K) p
(mb)