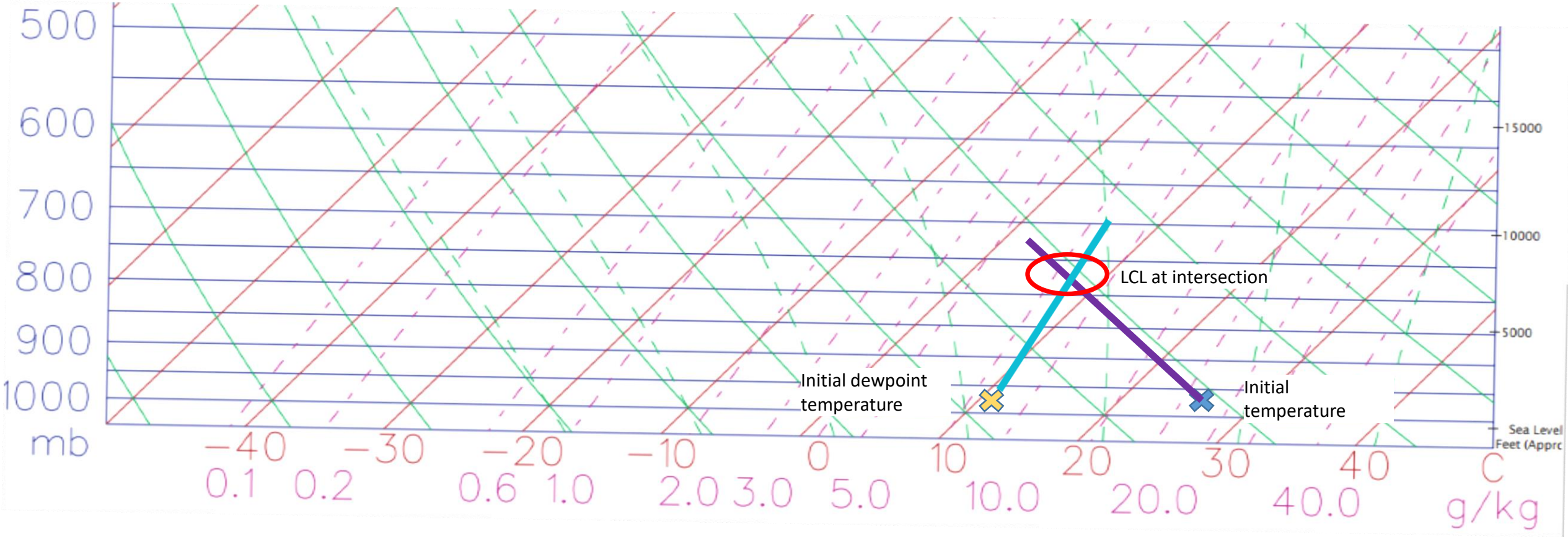
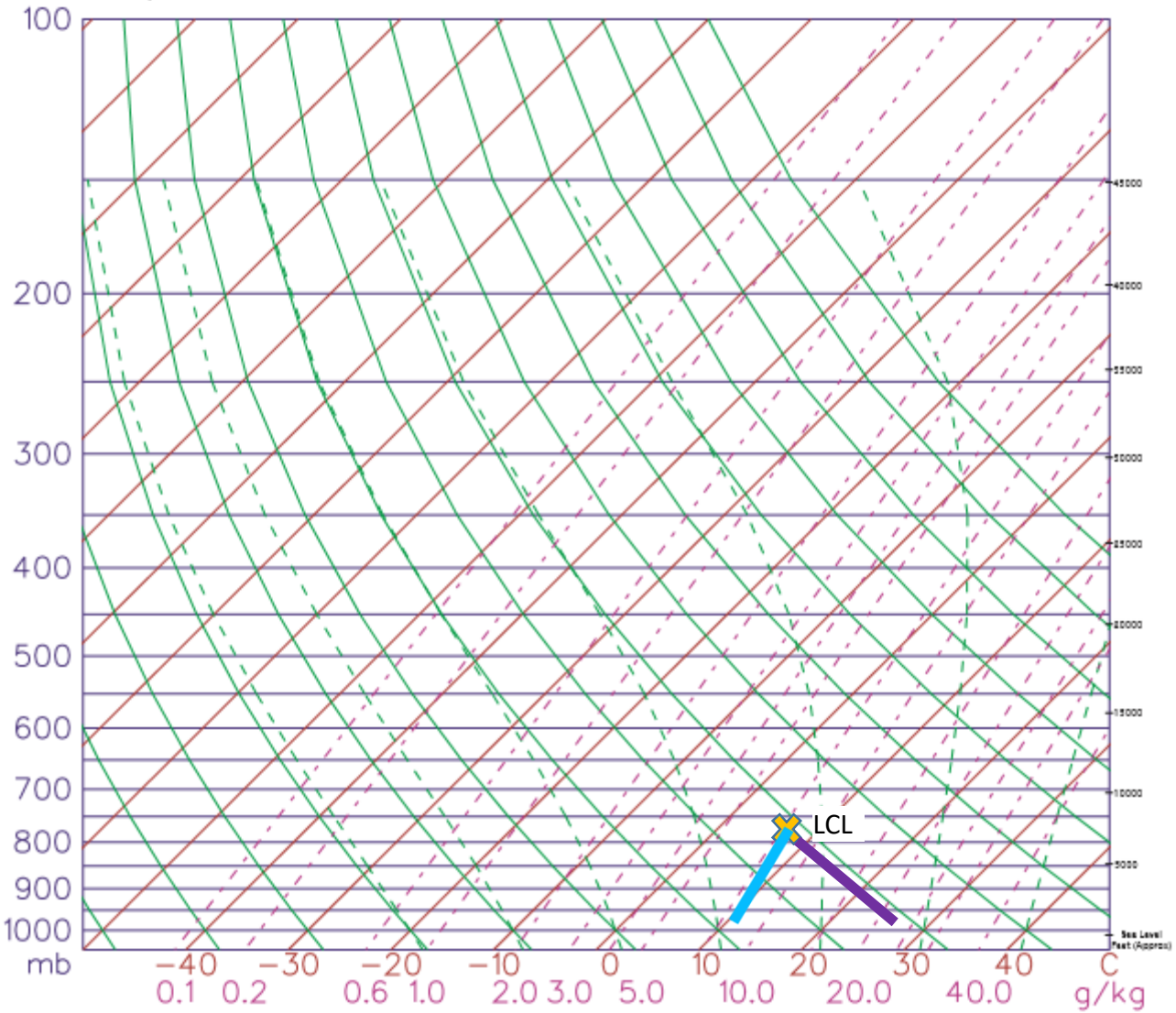
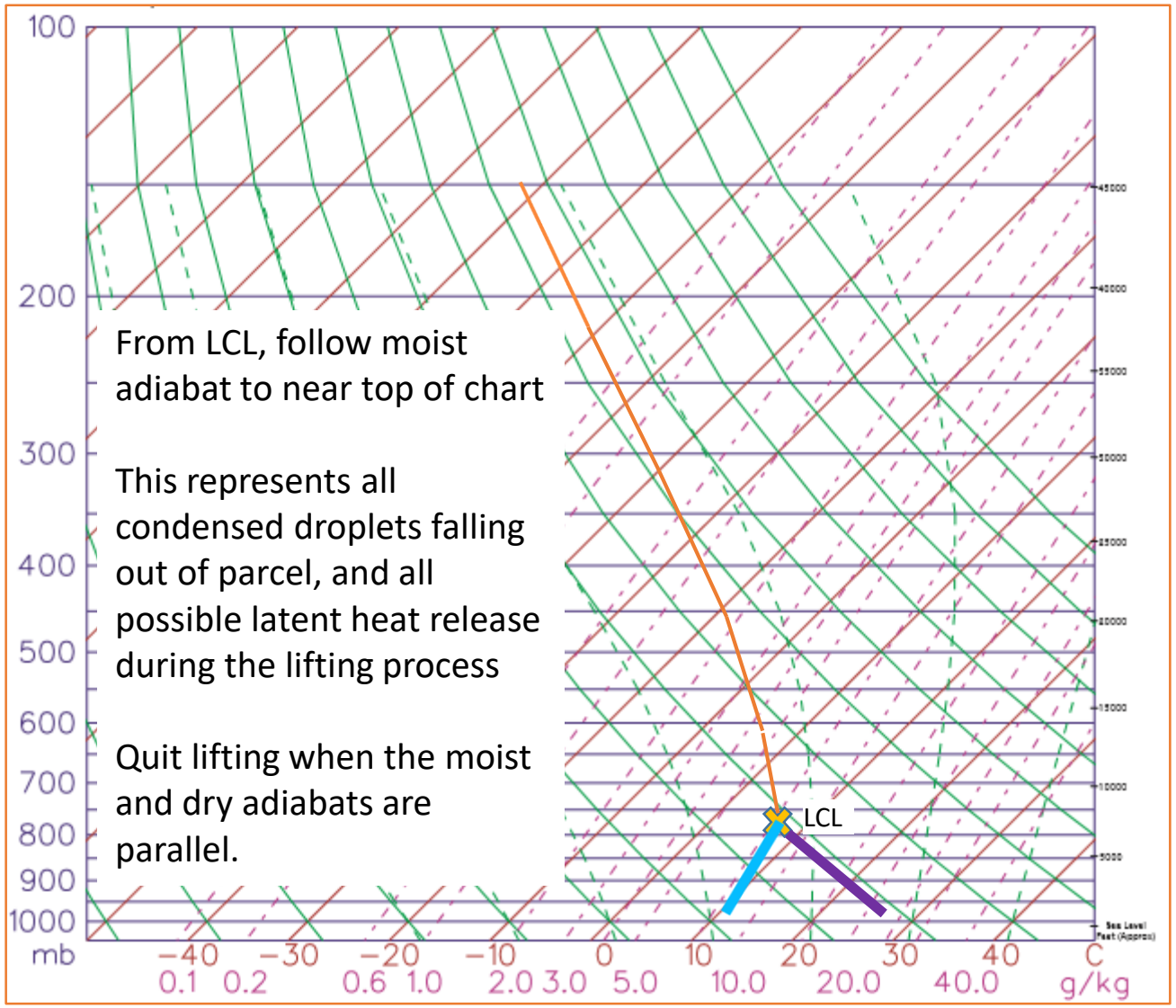
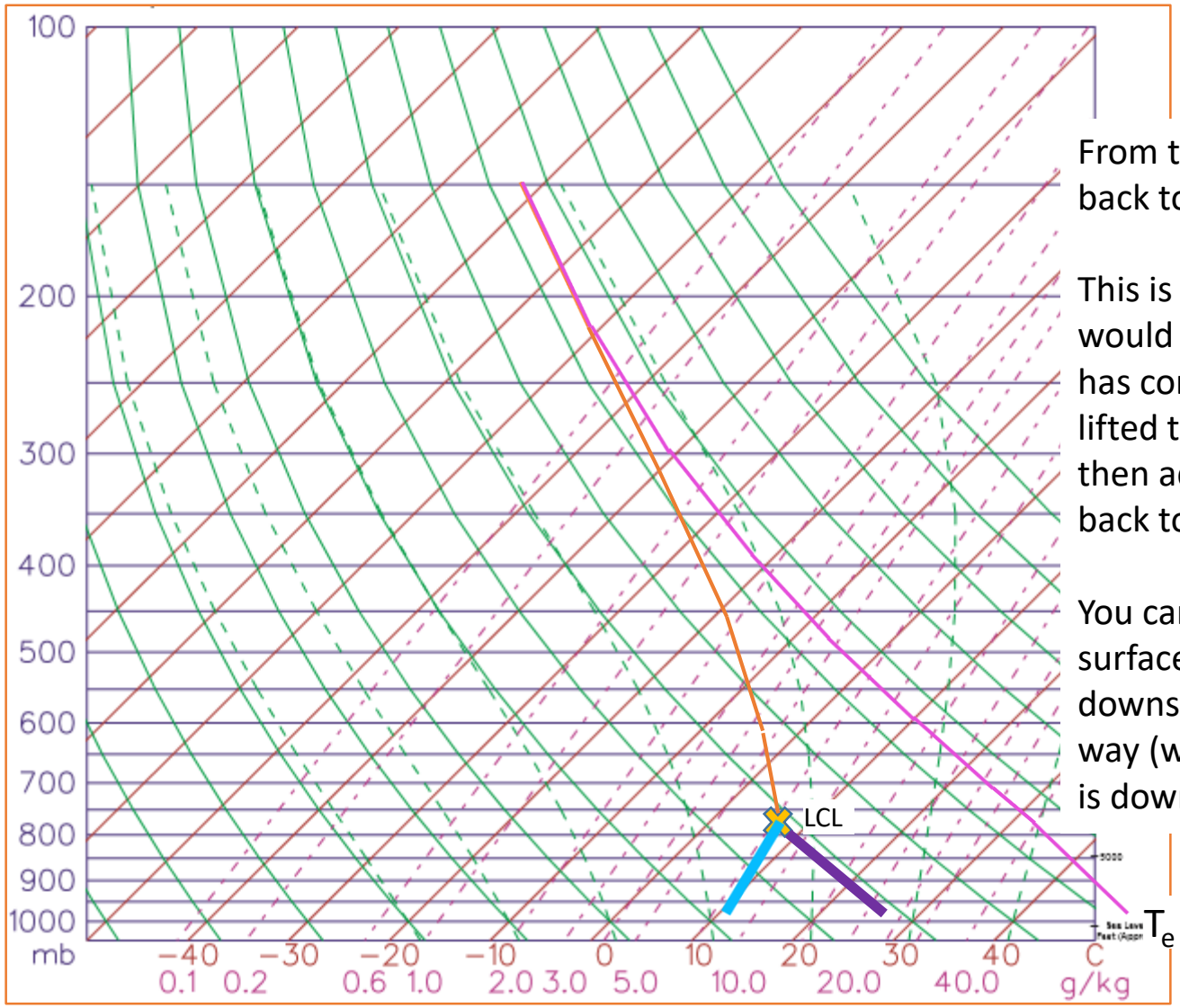

500
600
700
800
900
1000
mb
−40
−30
−20
−10
0
10
20
30
40
C
0.1
0.2
0.6
1.0
2.0
3.0
5.0
10.0
20.0
40.0
g/kg
15000
10000
5000
Sea Level
Feet (Approc
LCL at intersection
Initial dewpoint
temperature
Initial
temperature


100
200
300
400
500
600
700
800
900
1000
mb
−40
−30
−20
−10
0
10
20
30
40
C
0.1
0.2
0.6
1.0
2.0
3.0
5.0
10.0
20.0
40.0
g/kg
LCL


From LCL, follow moist adiabat to near top of chart
This represents all condensed droplets falling out of parcel, and all possible latent heat release during the lifting process
Quit lifting when the moist and dry adiabats are parallel.
LCL
100
200
300
400
500
600
700
800
900
1000
mb
−40 −30 −20 −10 0 10 20 30 40 C
0.1 0.2 0.6 1.0 2.0 3.0 5.0 10.0 20.0 40.0 g/kg

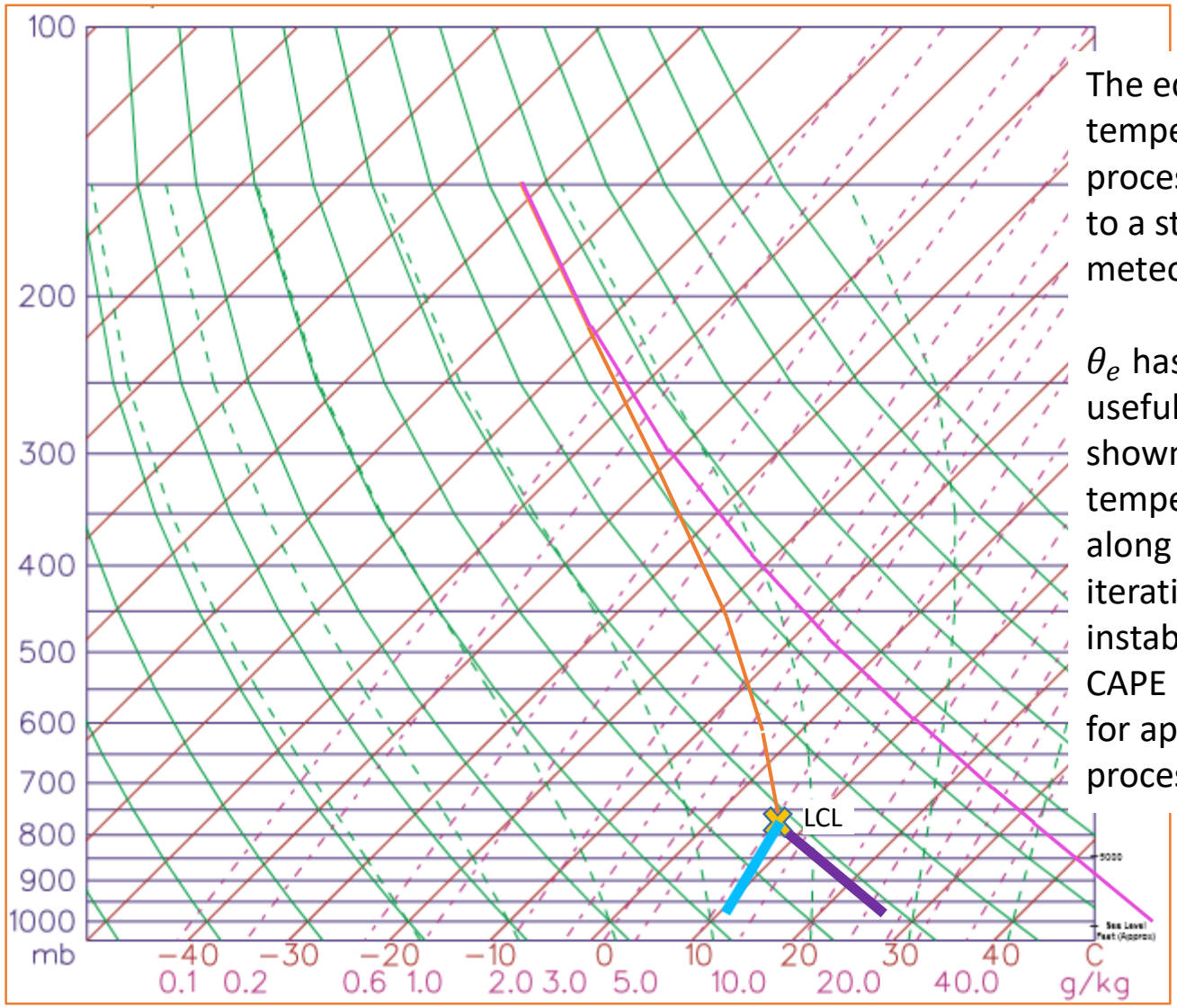


From top, follow dry adiabat back to original level (980 mb)

This is the temperature the air would have after all moisture has condensed and fallen out if lifted to top of atmosphere, then adiabatically compressed back to the original level

You can crudely estimate the surface temperature downslope of a mountain this way (when the wind direction is downslope)

T_e ≈50°C



The equivalent potential temperature is the same process, except its compressed to a standard level. In meteorology, this is 1000 mb.

θ_e has conservative processes useful in math applications. As shown in the notes, temperature can be solved along a moist adiabat by iteration. This is used for parcel instability calculations such as CAPE and stability indexes, and for approximating cloud processes in weather models.

$\theta_e \approx 52°C$