S-Pol Refractivity Applications: Some Preliminary SoWMEX/TiMREX Observations

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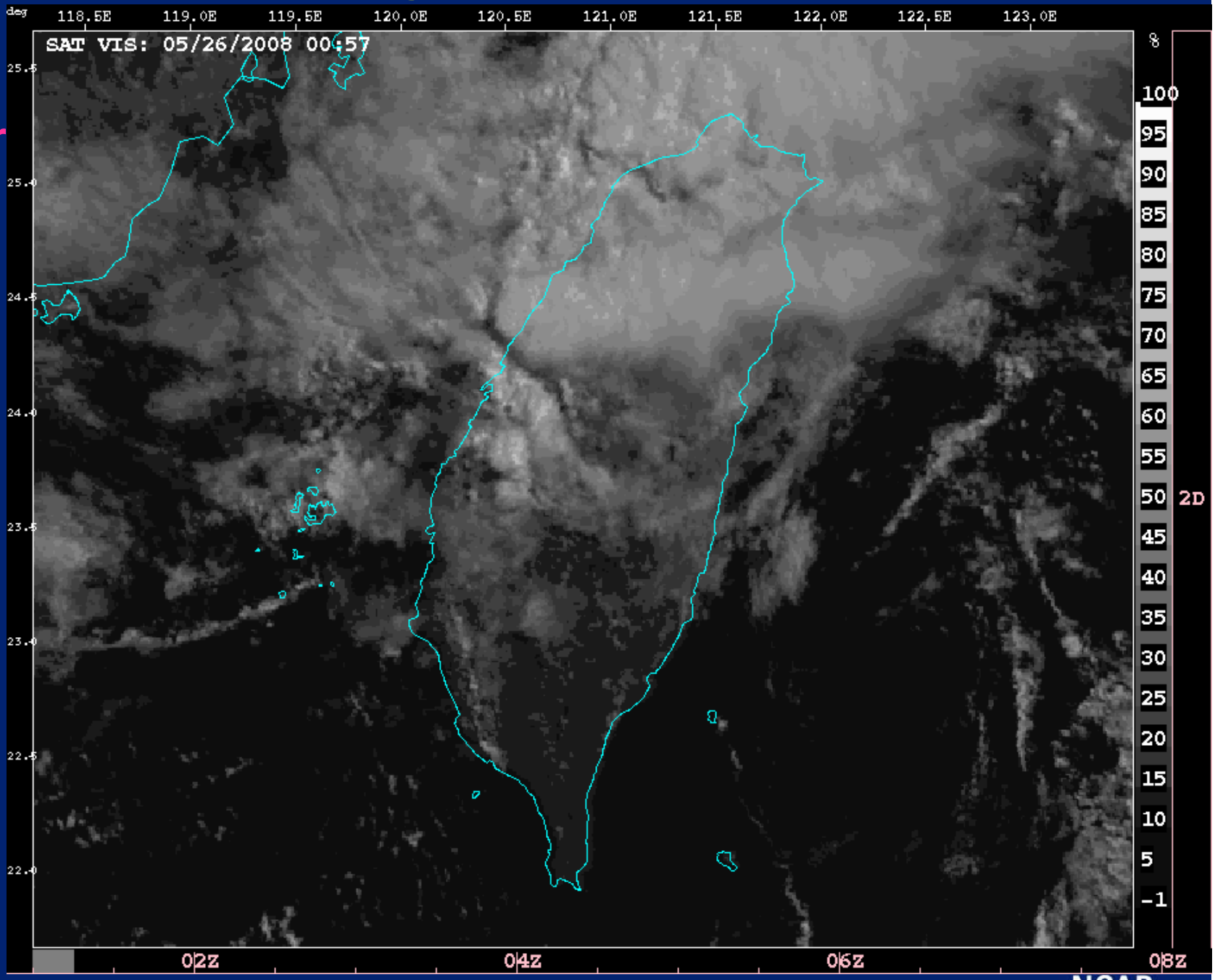
2nd SoMEX/TiMREX Workshop, CWB, Taipei
20 October 2009

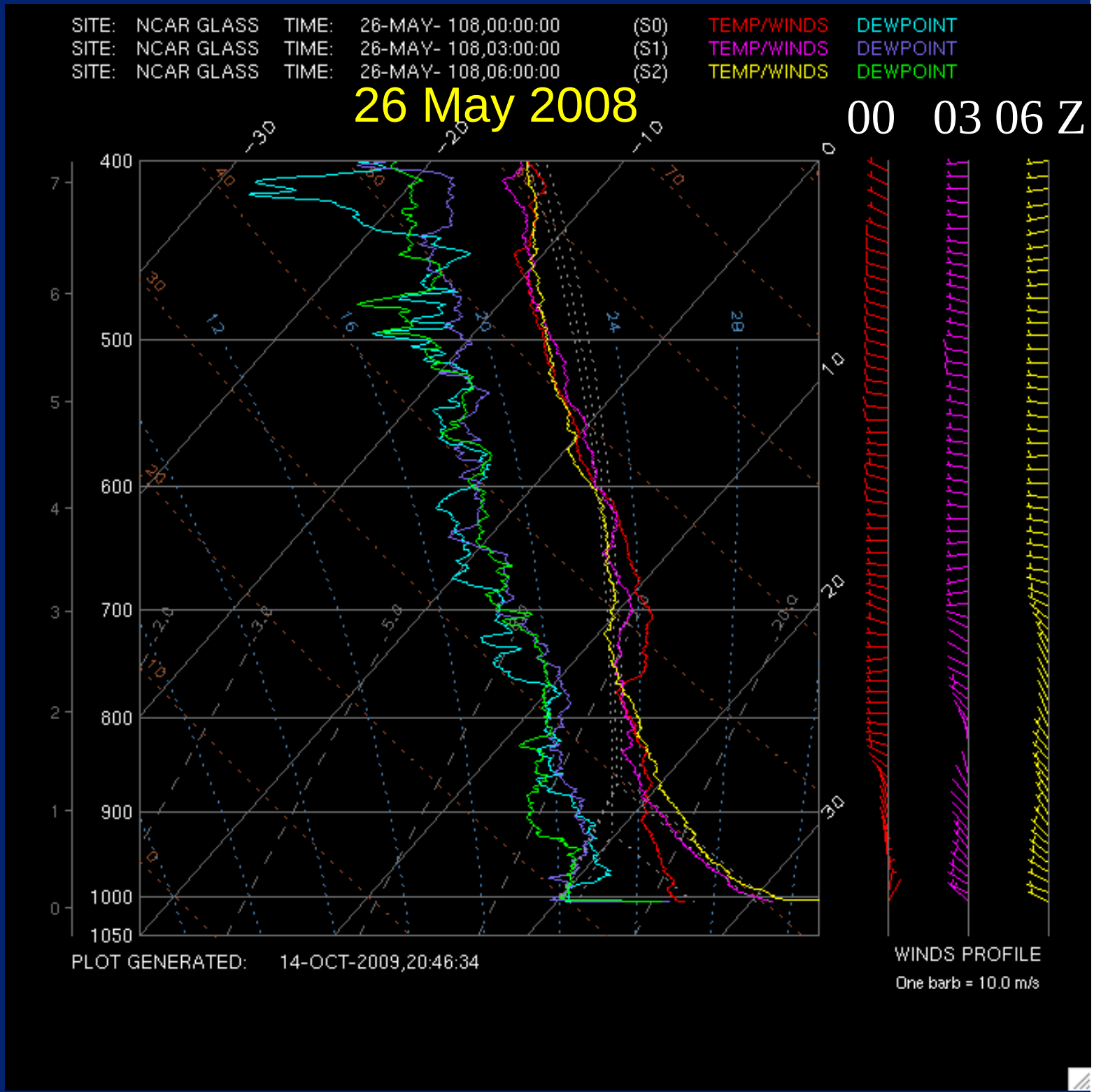
NCAR

26 May 2008

- Mostly clear in S. Taiwan in morning
- SBF with convection develops at 0130 UTC
- Enhanced convection in mountains by 05 UTC

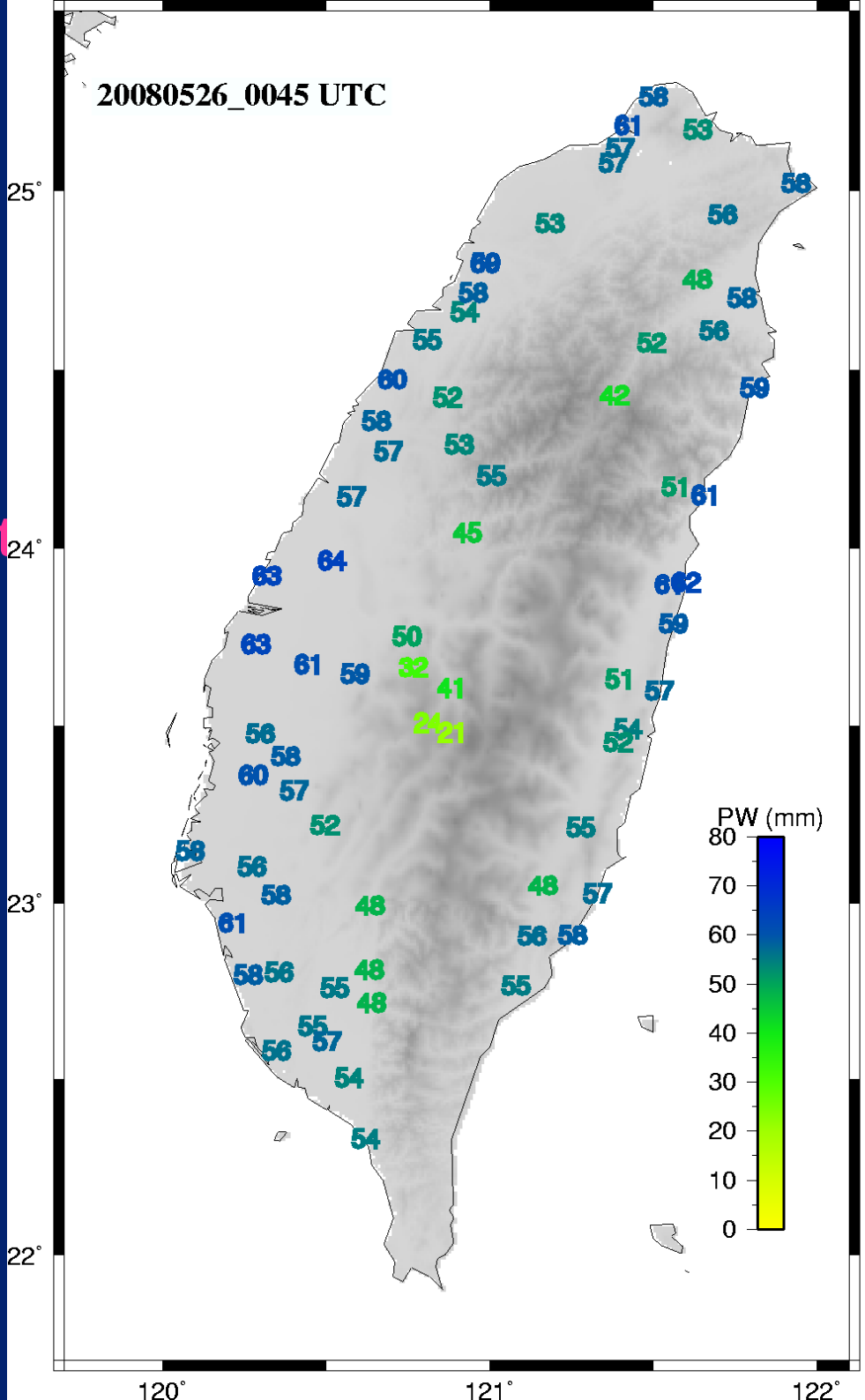


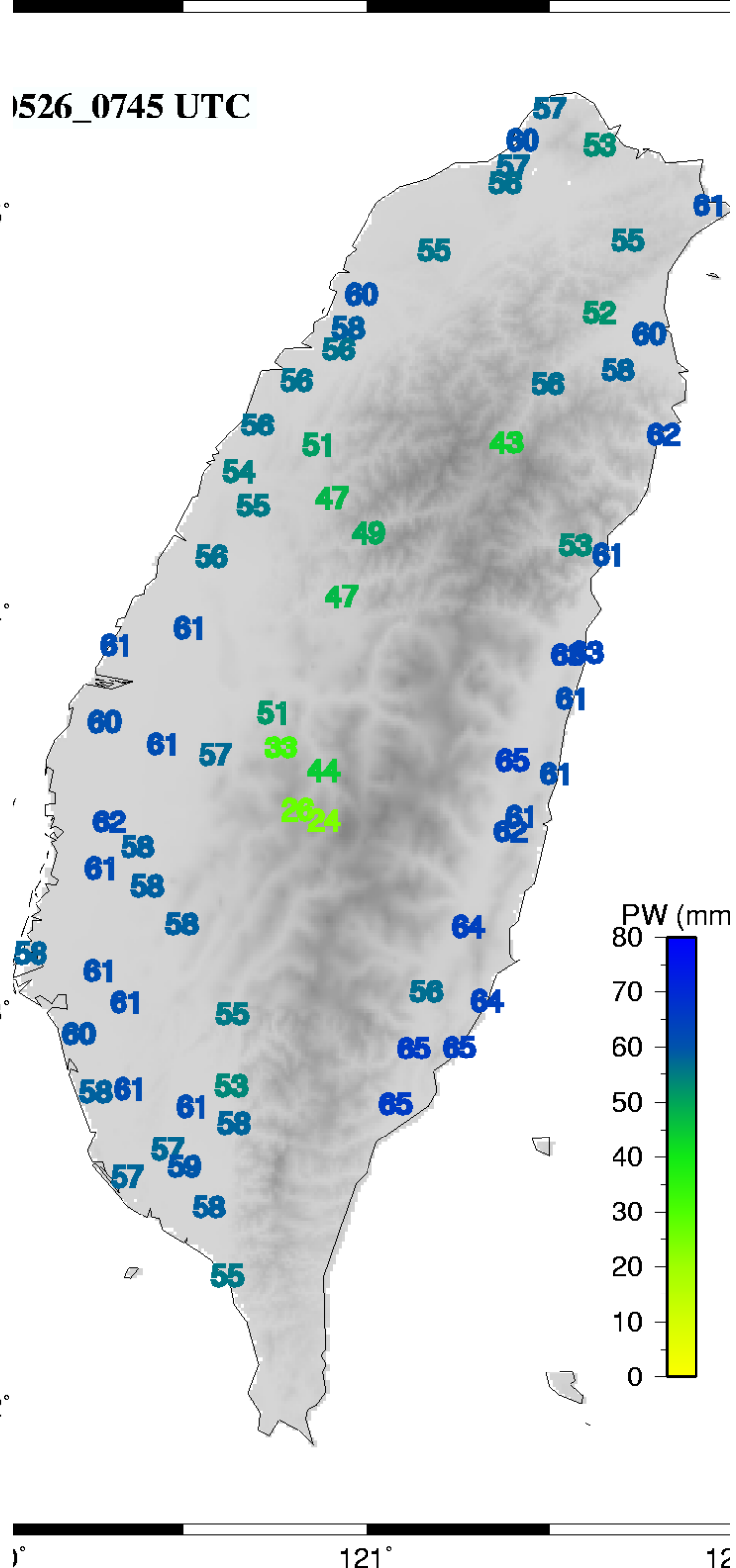
- **CBL growth: warming and drying**
- **Moist throughout sounding**
- **Midlevel inversion at 00 and 03 UTC**
- **CAPE/CIN (J/kg) 125/-197 (00 UTC) 201/-37 (03 UTC) 298/-54 (06 UTC)**
- **SBF passed Pingdong between 00 and 03 UTC sondes**



26 May 2008

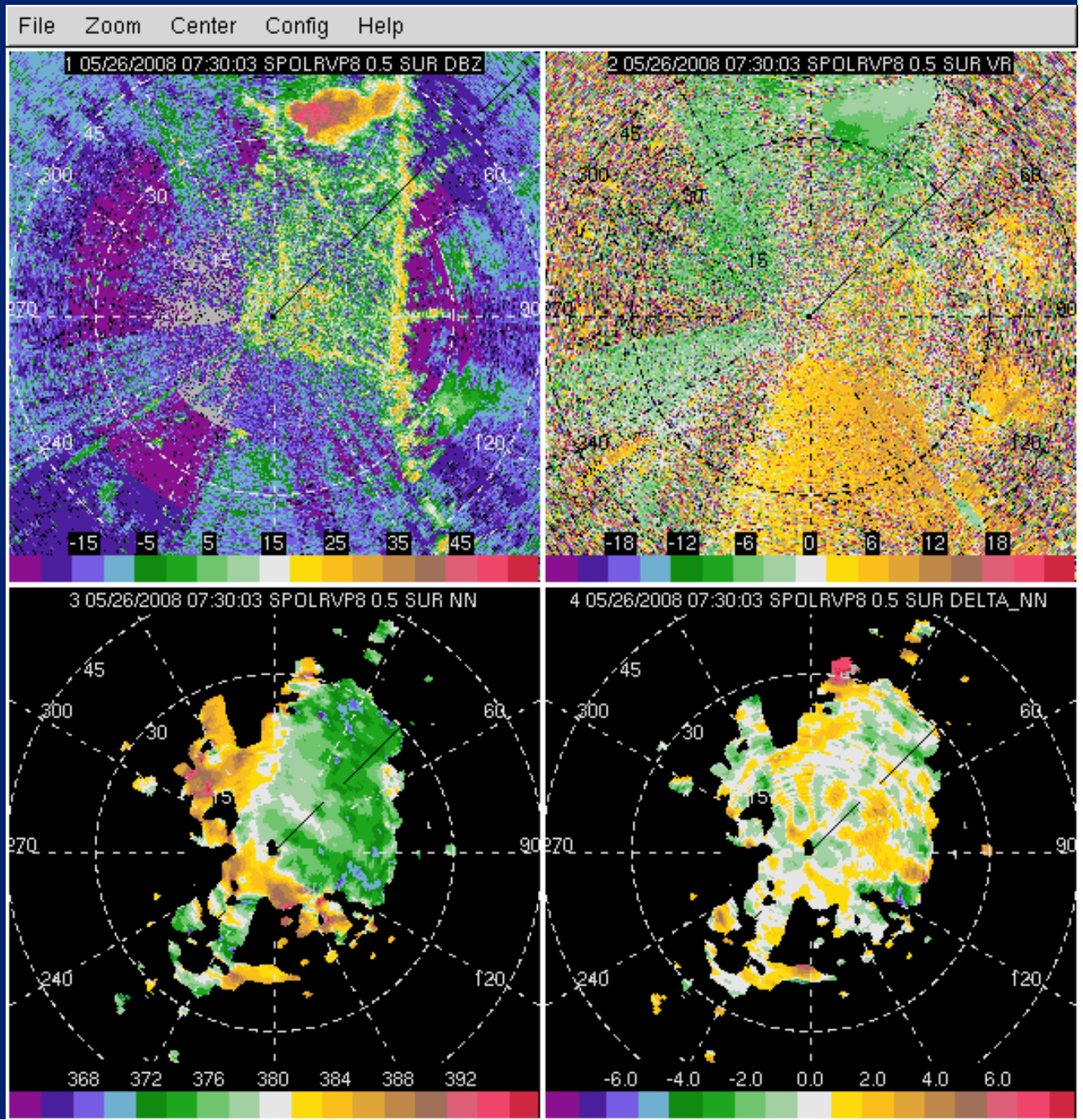
- Consistent PW throughout the day
- Moisture in foothills after SBF passage (0145 UTC)





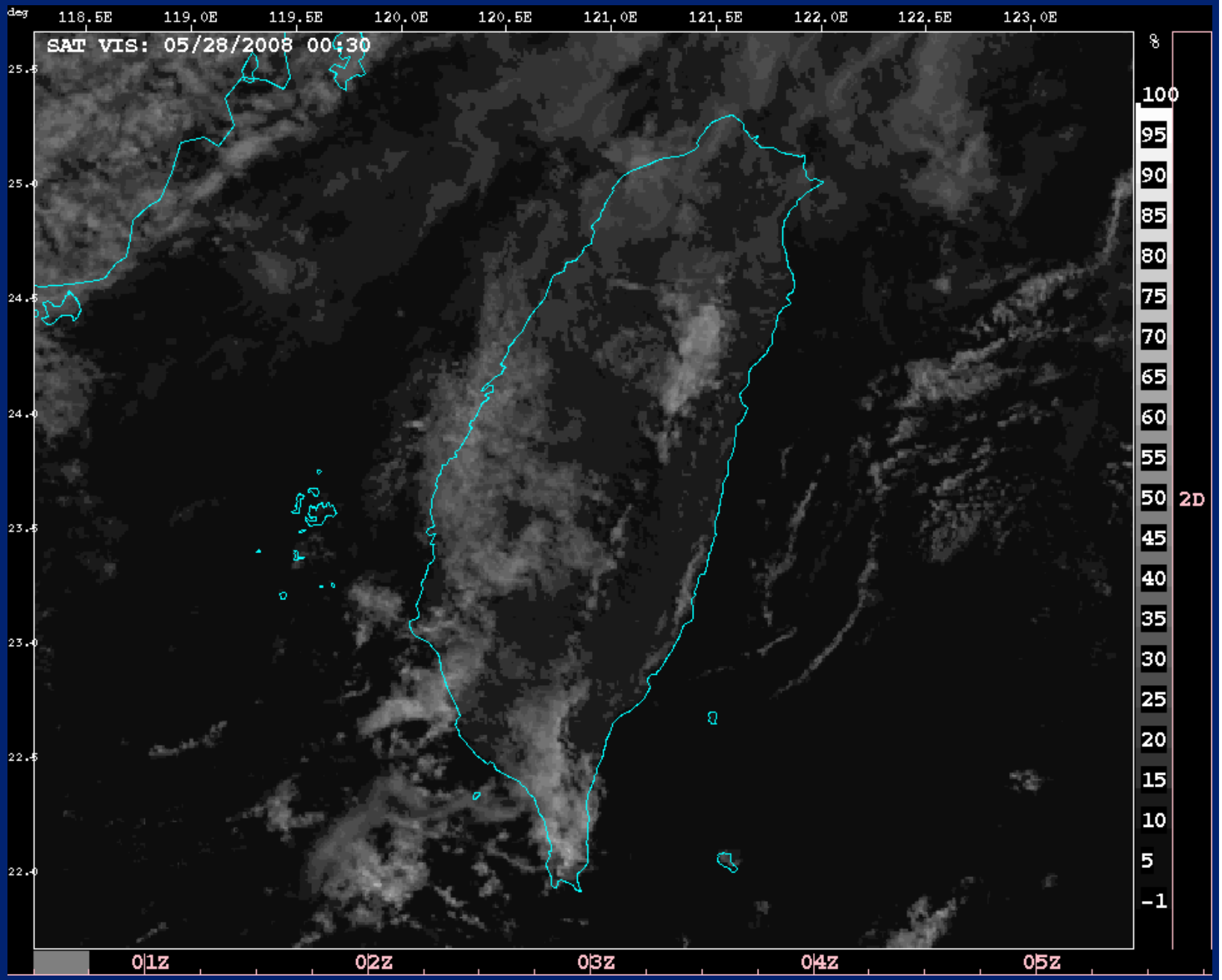
26 May 2008

- SBF 01-03 UTC
- Increase in N behind SBF; Delta N signature
- CI: 0142 & 0242 UTC
- CI in high N regions near N gradients
- Gust front after 07 UTC has brief N and Delta_N signature
- Significant structures and variability in N

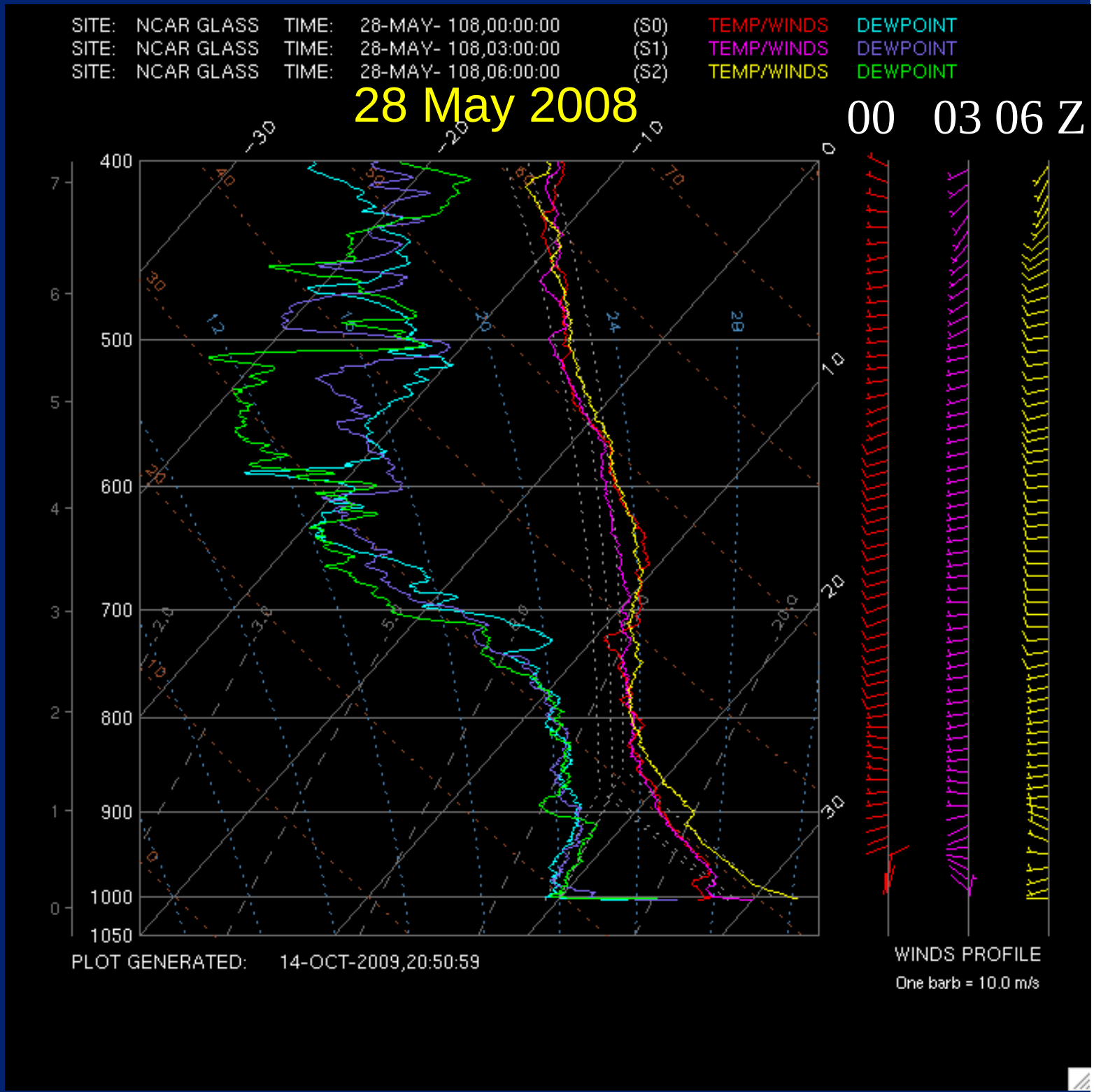


28 May 2008

- Convection first intensifies and then dissipates as it reaches the mountains

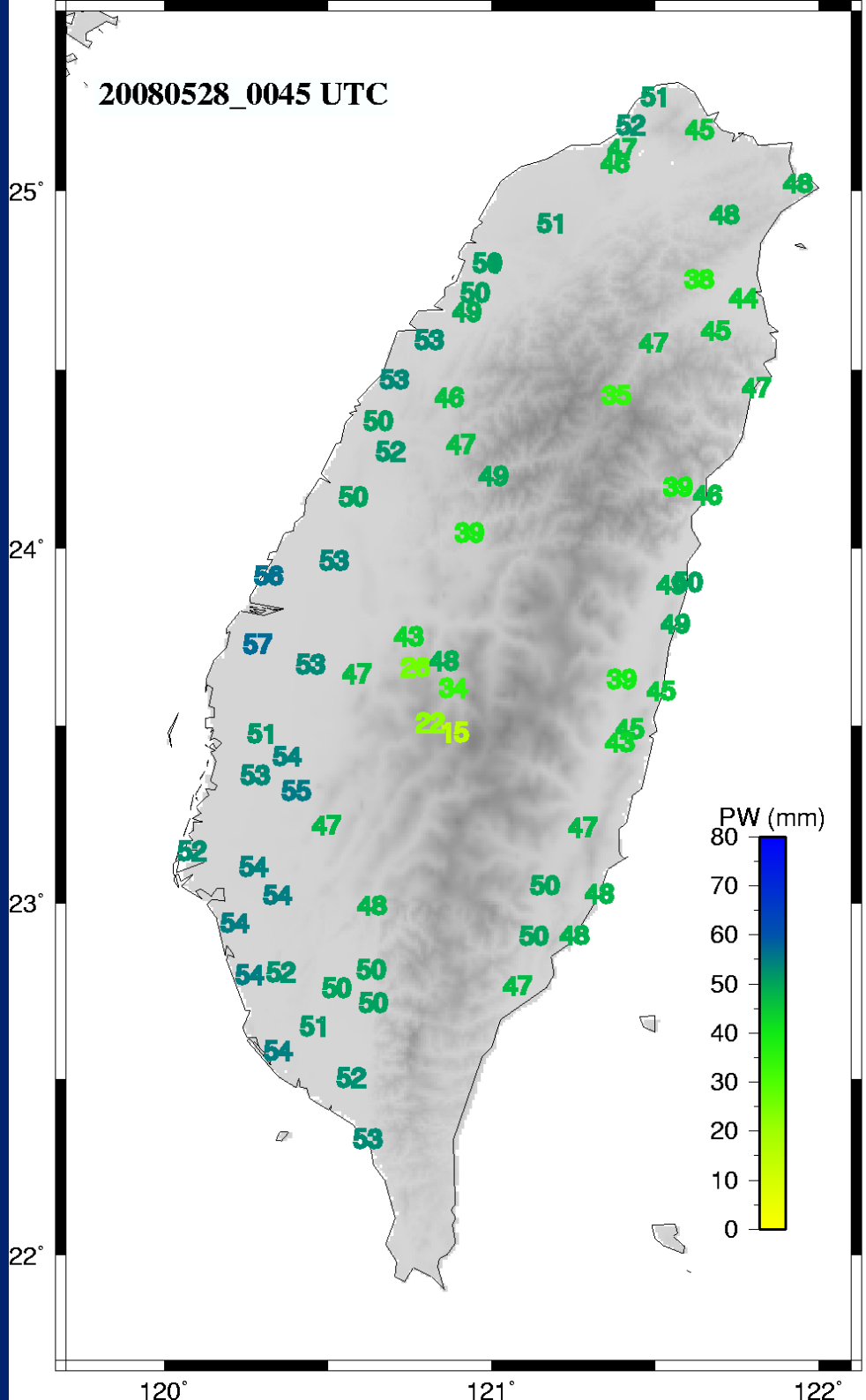


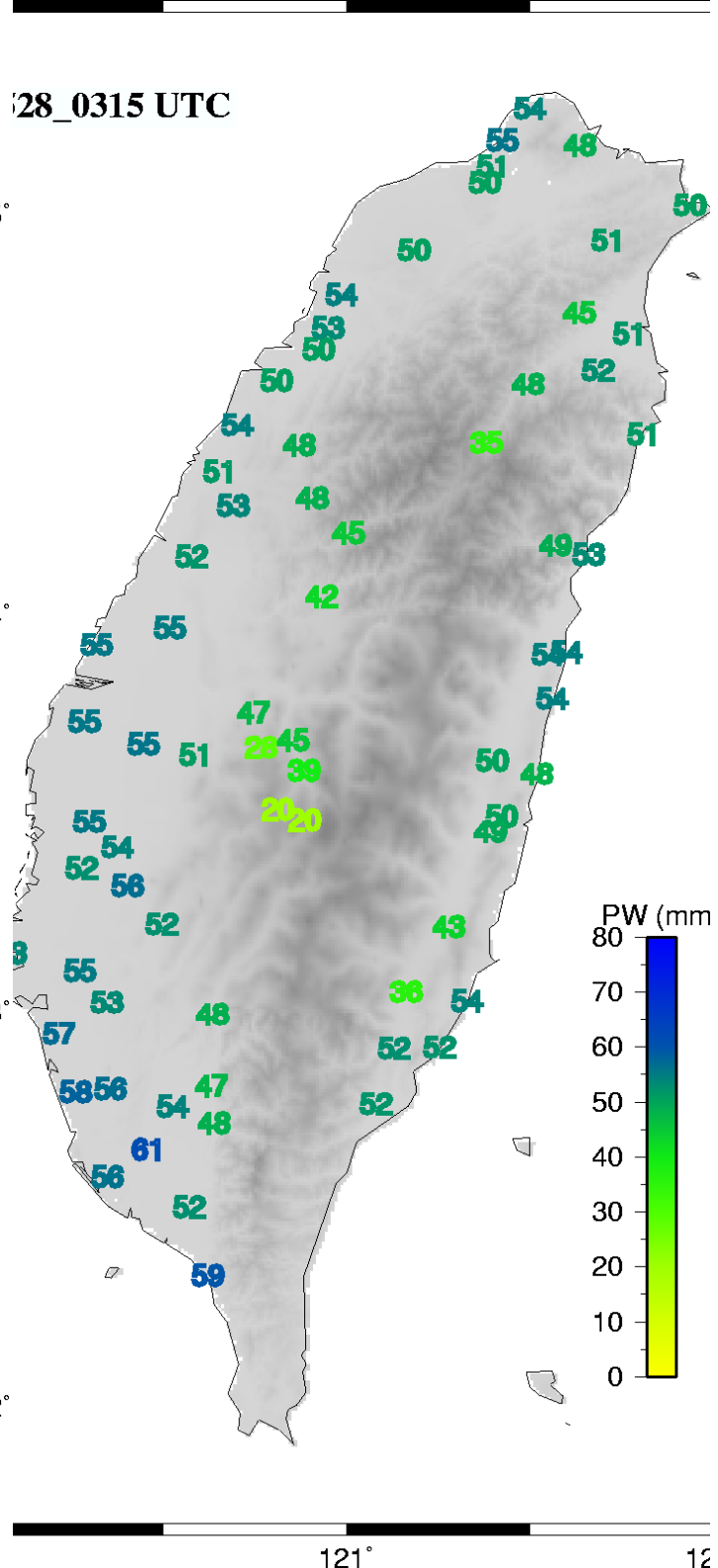
- CBL growth more gradual due to cloud cover: warming and drying
- Moist to 700 mb
- Midlevel inversion at 00 and 06 UTC
- CAPE/CIN (J/kg)
  N/A (00 UTC)
  33/-148 (03 UTC)
  82/-112 (06 UTC)
- Weak SBF passed Pingdong between 00 and 03 UTC



28 May 2008

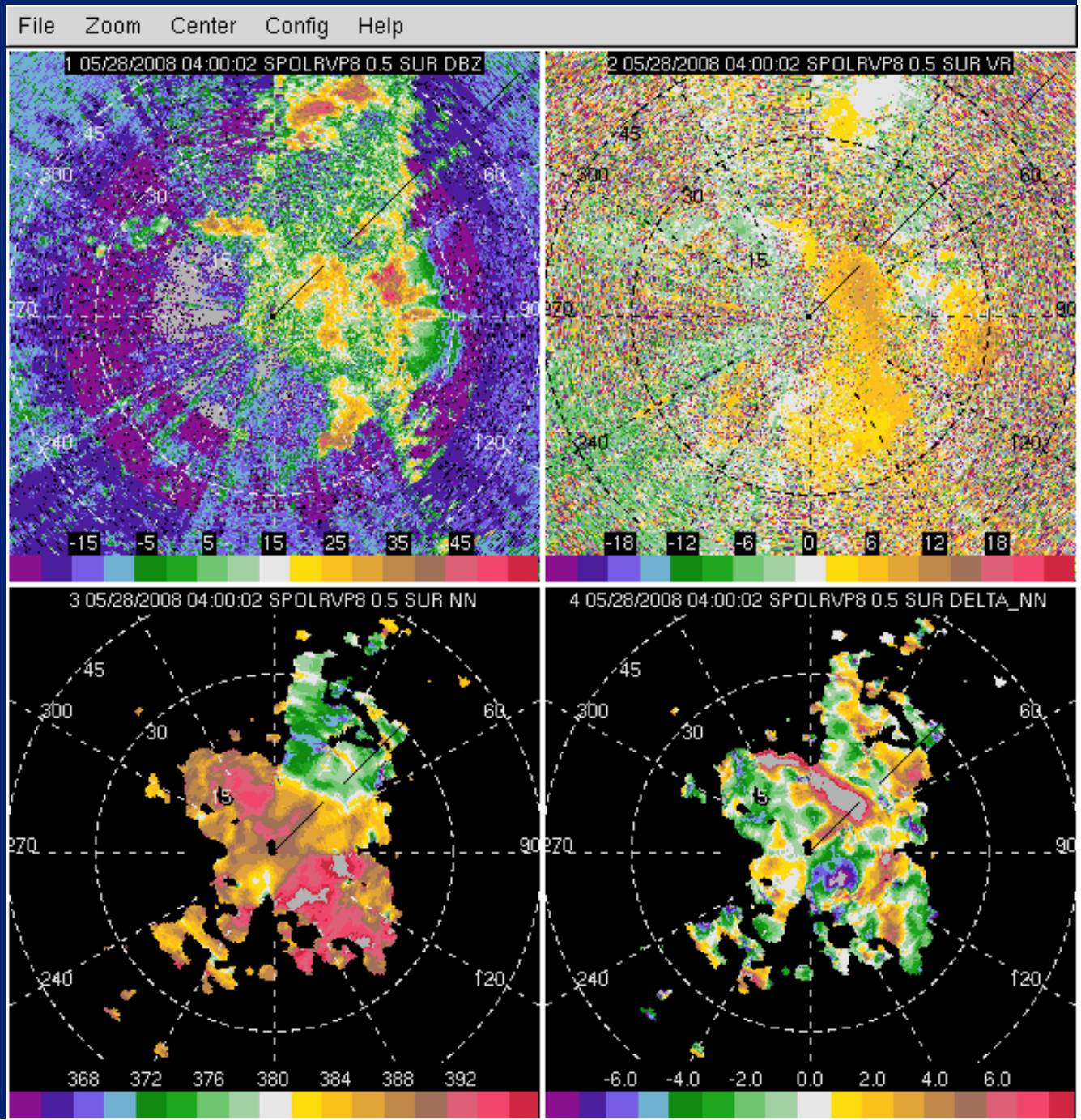
- Moistening along coast
- Drying in Foothills until 0445 UTC





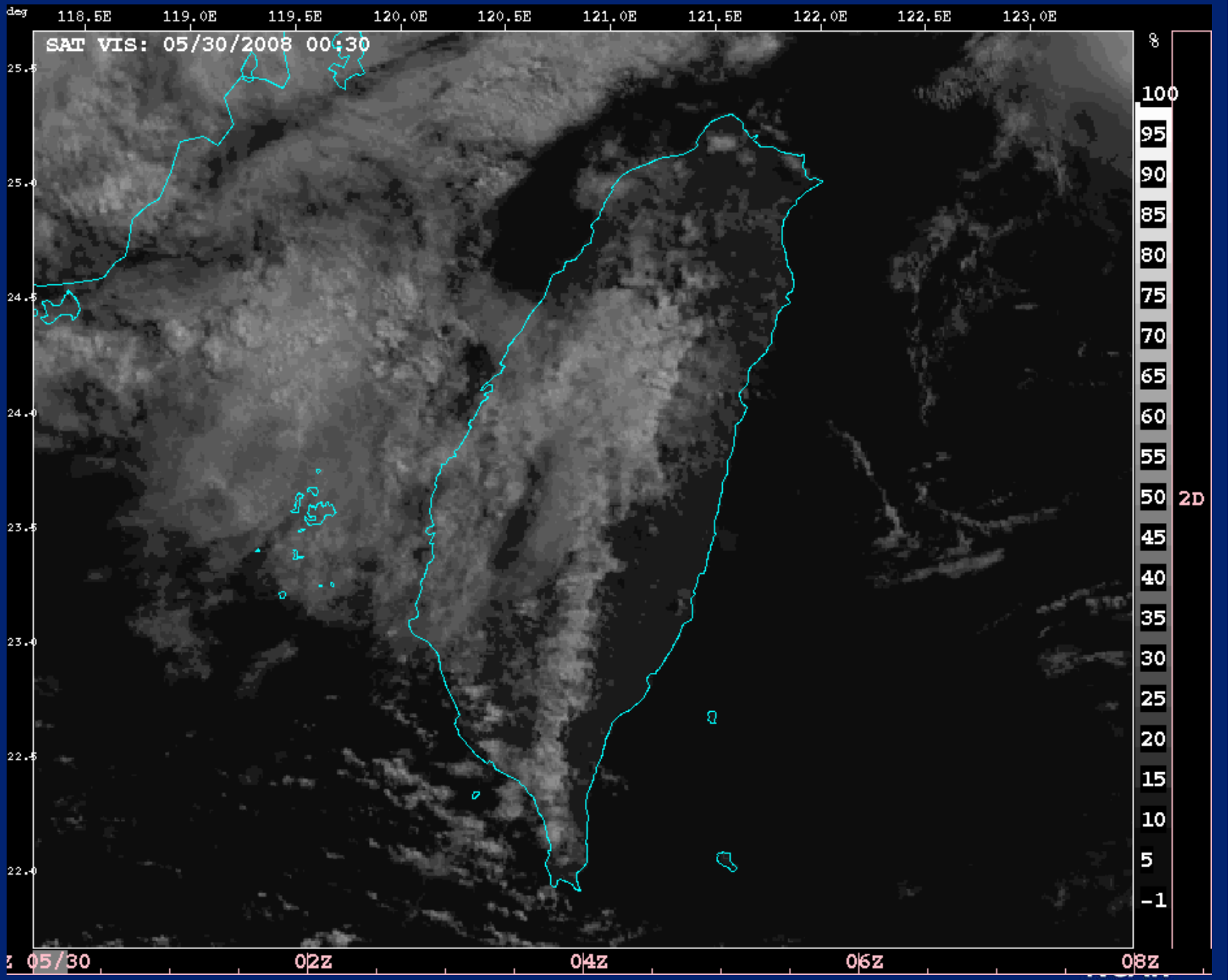
28 May 2008

- Convection dissipates as it moves into low N region
- CI @ 0315 UTC in advance of approaching squall line develops on high N and persistent Delta N region
- Convection tends to intensify (dissipate) as it moves into high (low) N regions



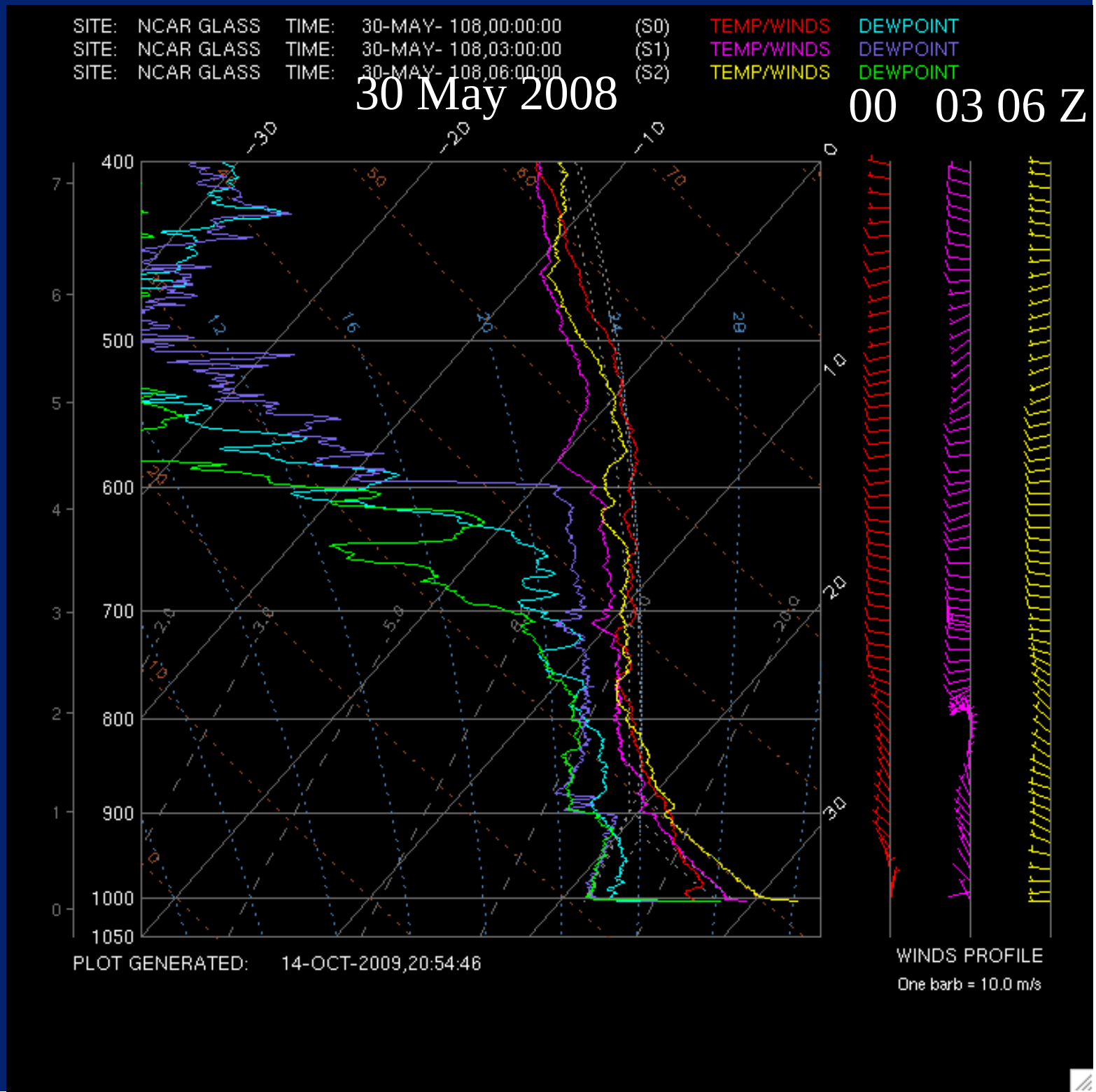
30 May 2008

- Convection moves onshore and intensifies



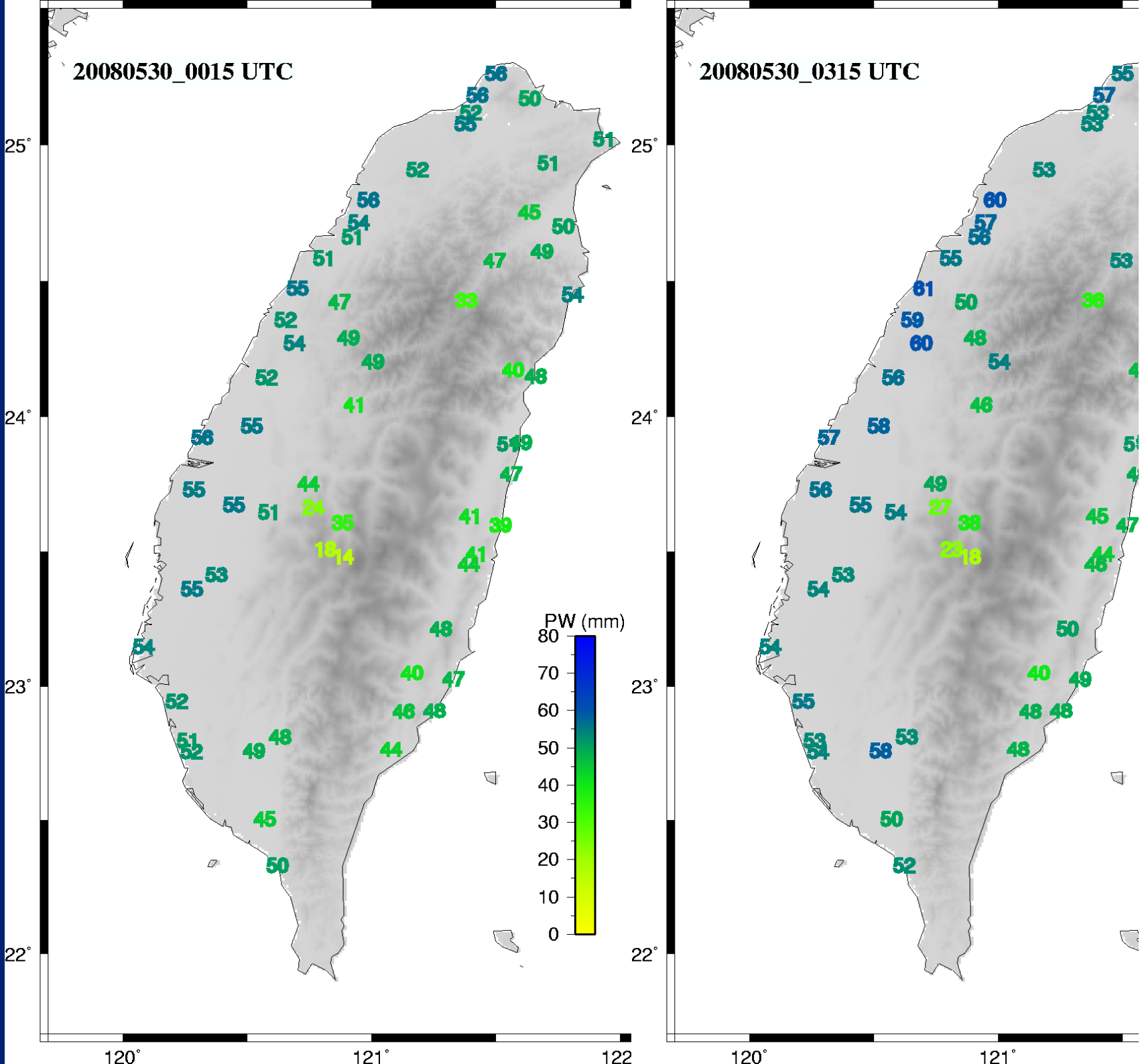
30 May 2008

- CBL growth: warming and drying
- Moist to 600 mb
- CAPE/CIN (J/kg)
  277/-41 (00 UTC)
  302/-19 (03 UTC)
  356/-19 (06 UTC)
- Weak SBF passage between 00 and 03 UTC



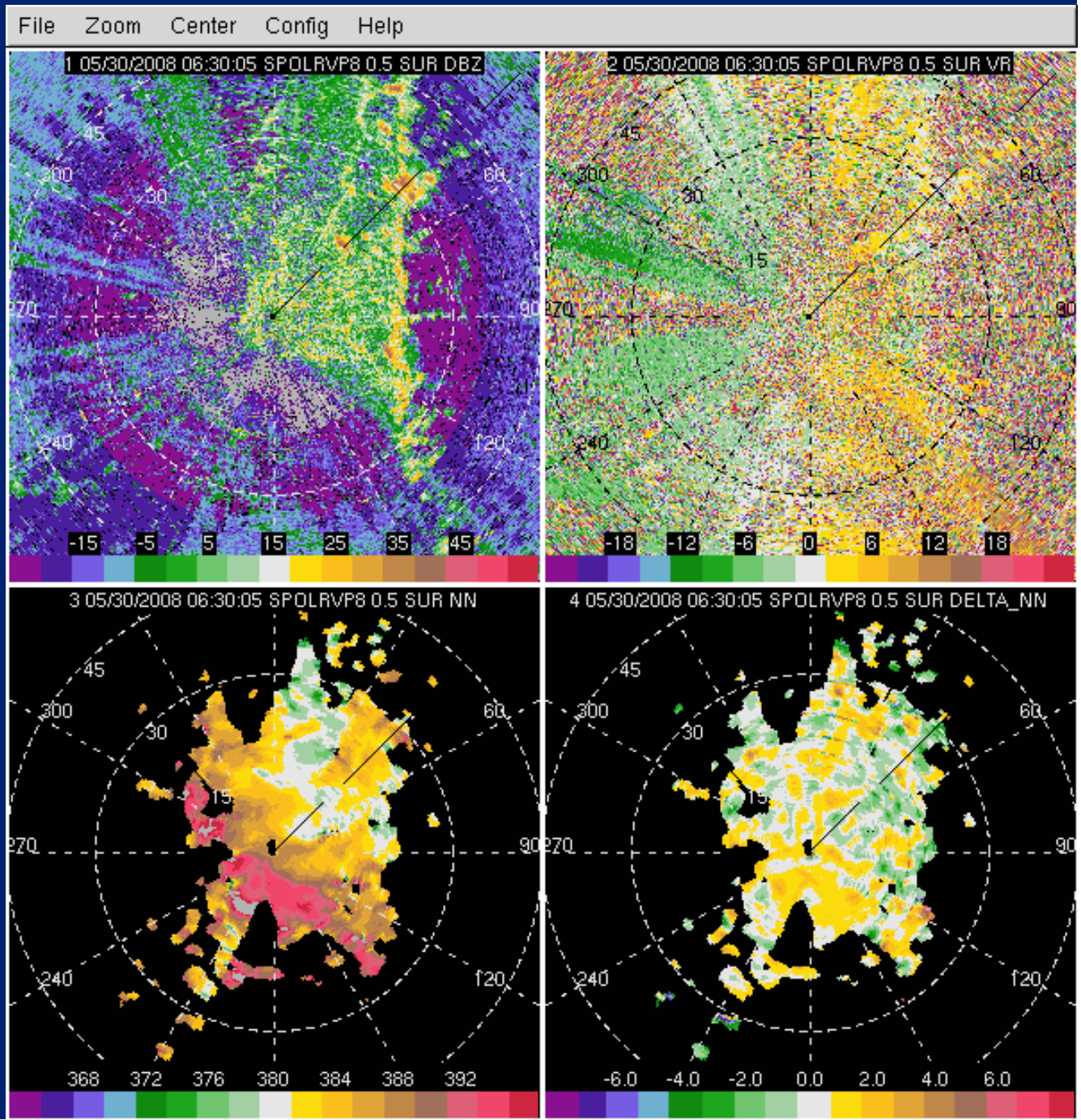
30 May 2008

- Slight moistening, consistent with soundings



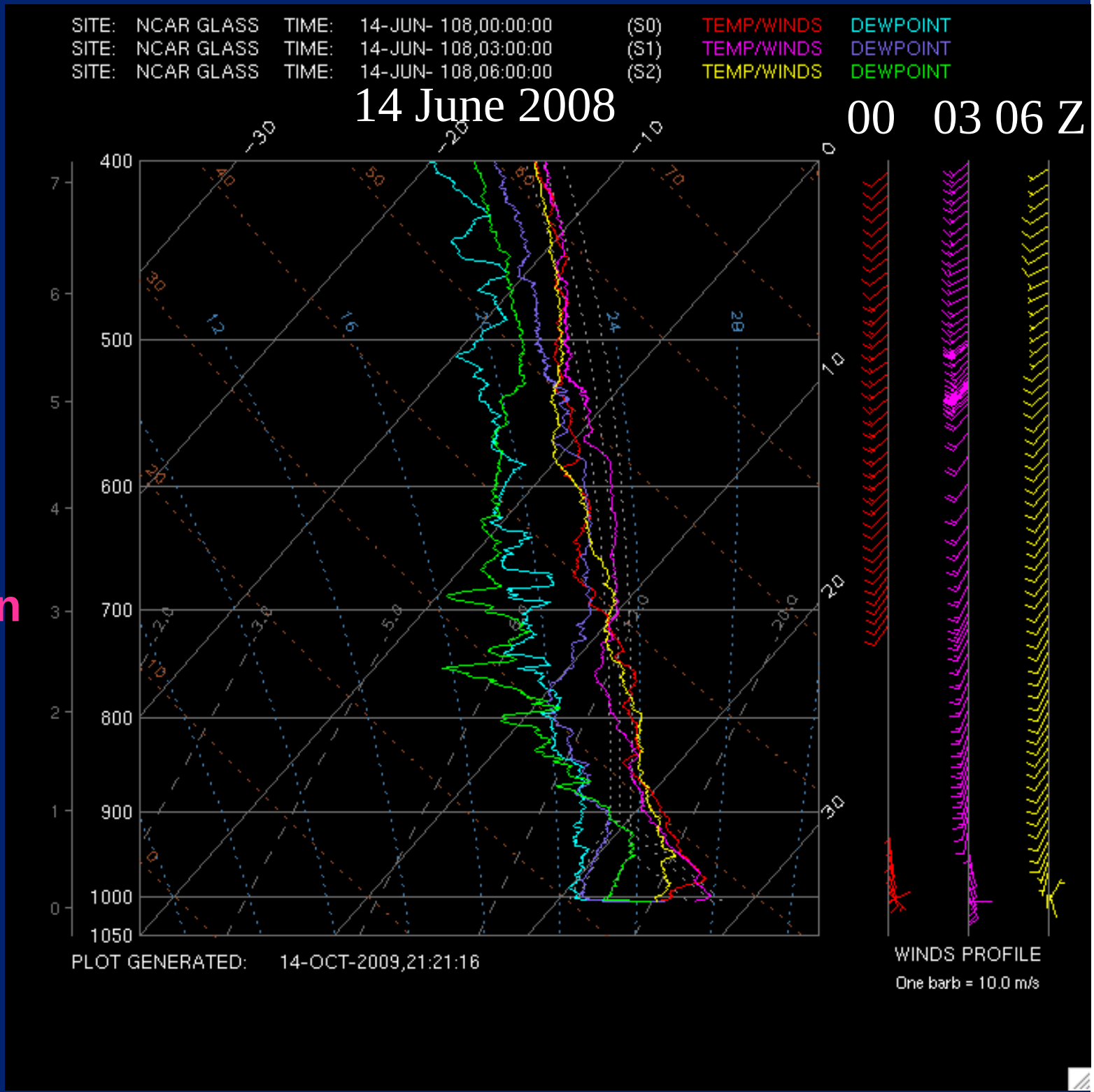
30 May 2008

- CI in moist air
- 0430: dry region moving onshore with decrease in convection; fine line forms later
- 06: CI in high N (moist) region near foothills
- N is useful to monitor spatial and temporal variations in low-level moisture/temperature



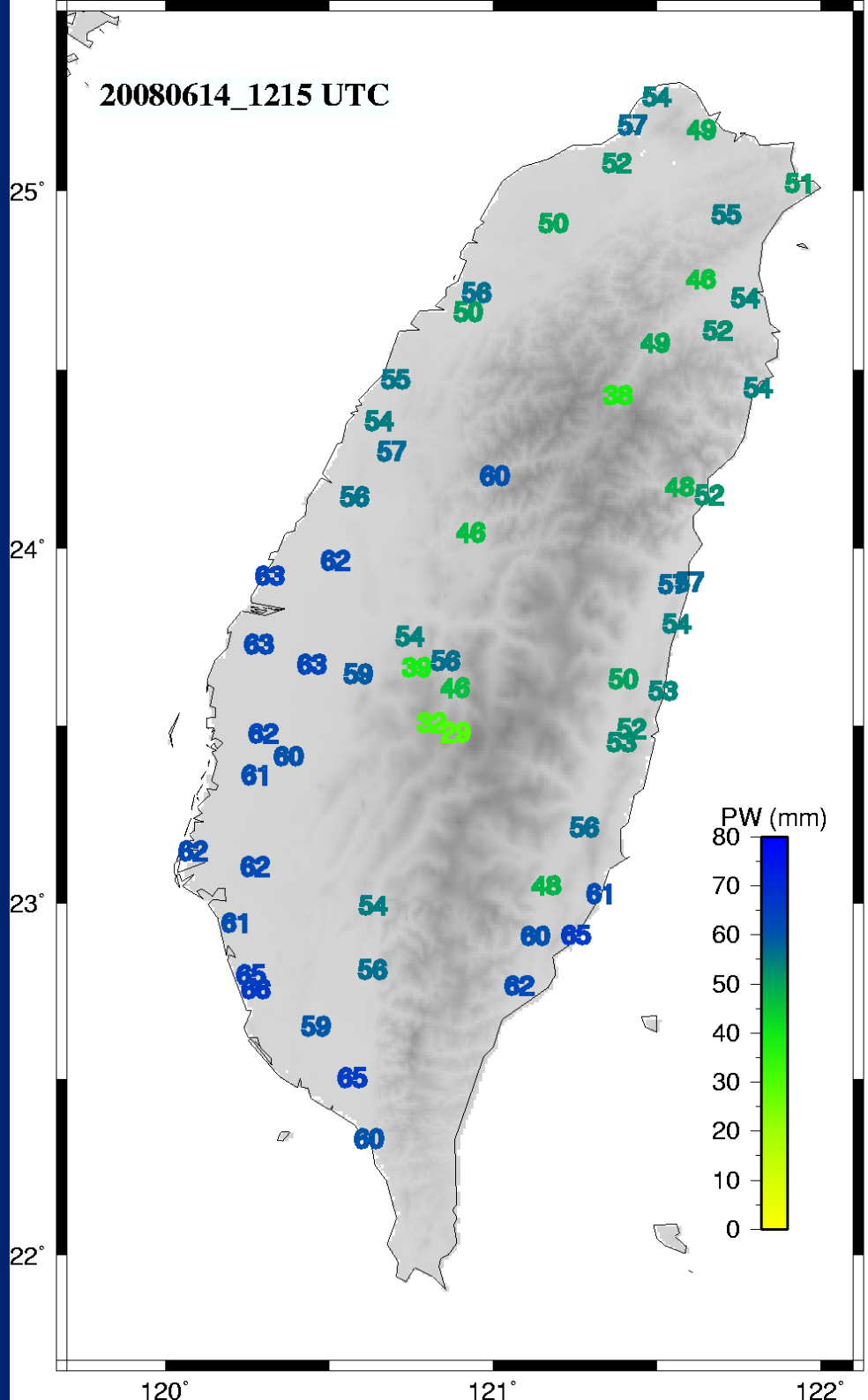
14 June 2008

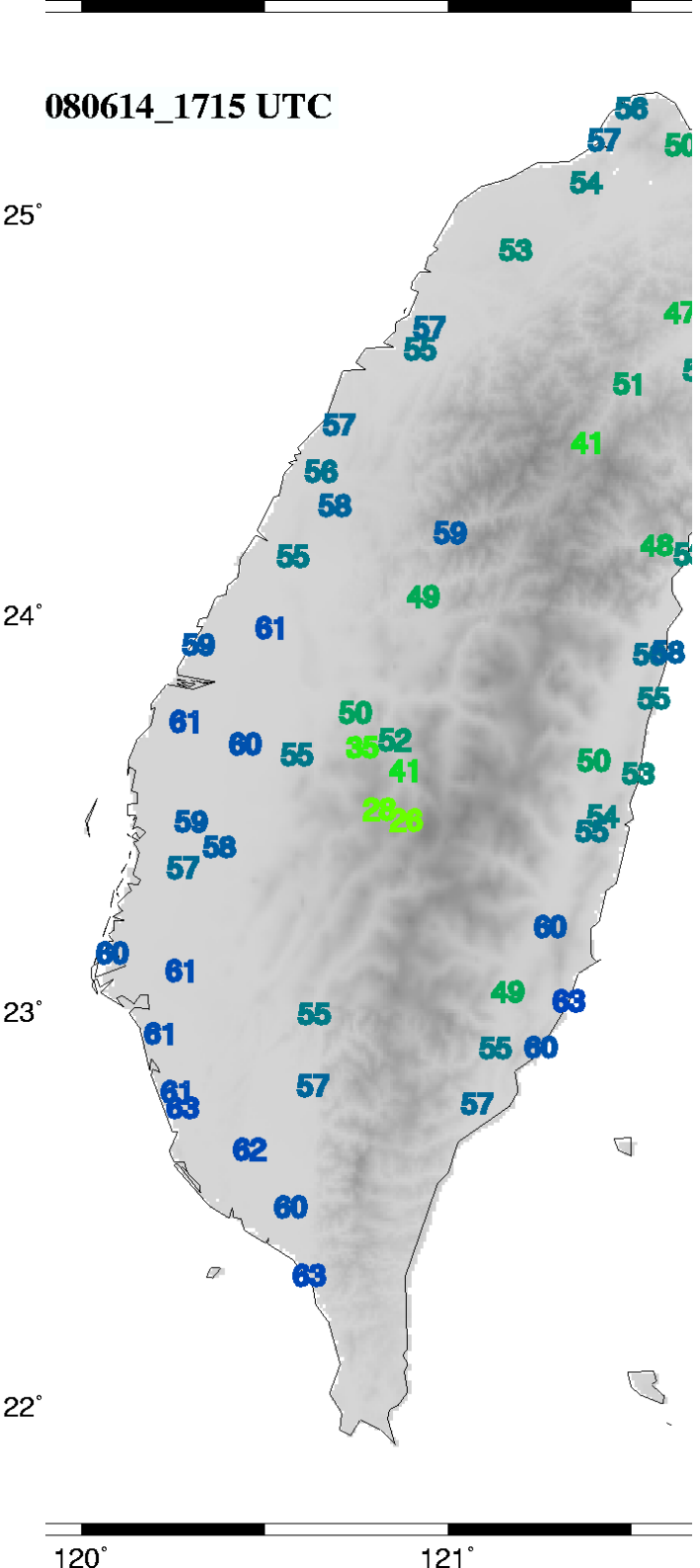
- IOP case: widespread precipitation
- CBL growth: cooling and moistening
- Surface inversion
- Deep moisture
- CAPE/CIN (J/kg)
  62/-84 (00 UTC)
  145/-59 (03 UTC)
  59/-57 (06 UTC)
- no SBF



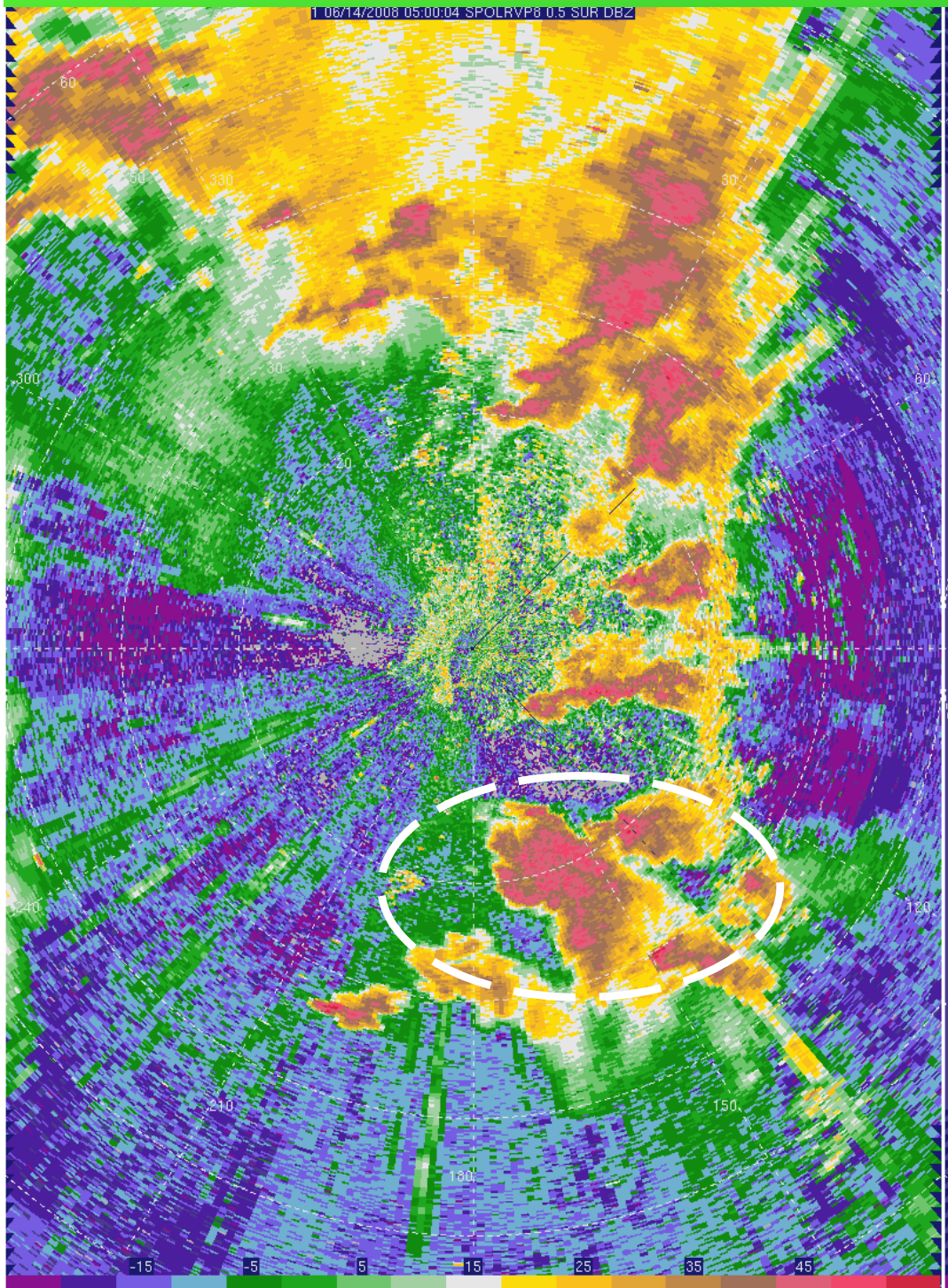
14 June 2008

- Little change in PW





IOP : June 14 :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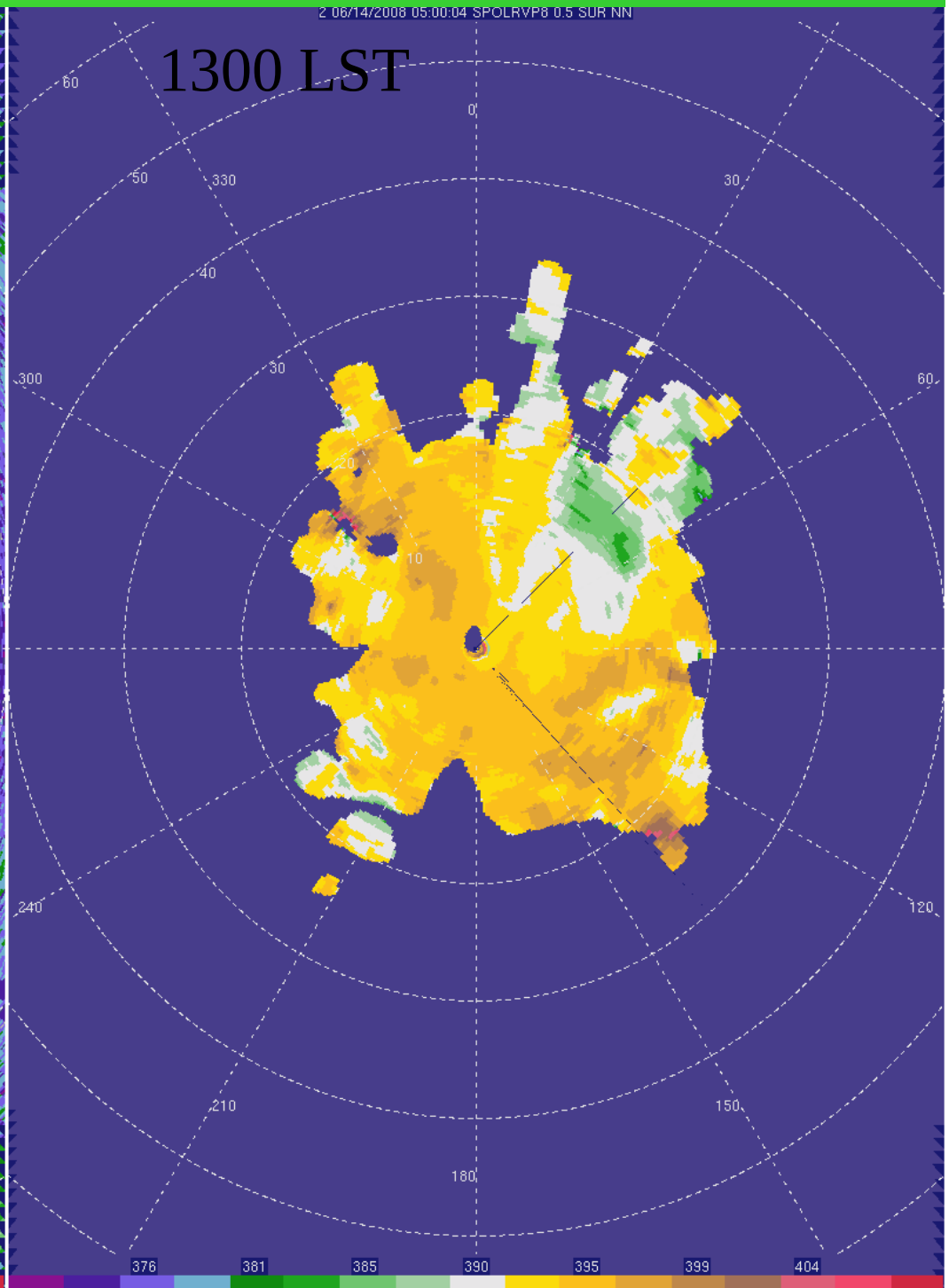
2 06/14/2006 05:00:04 SPOLRVP8 0.5 SUR NN
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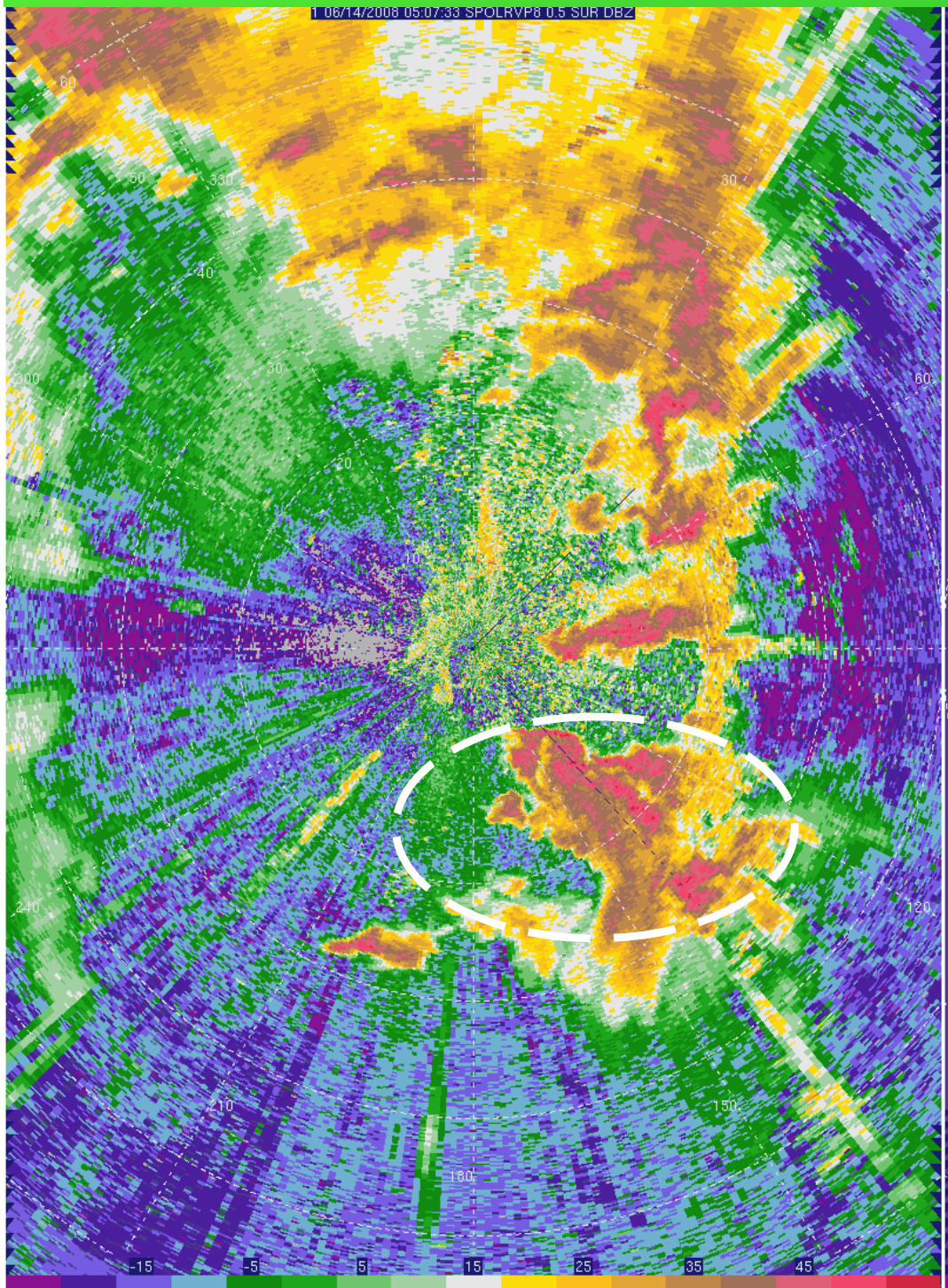
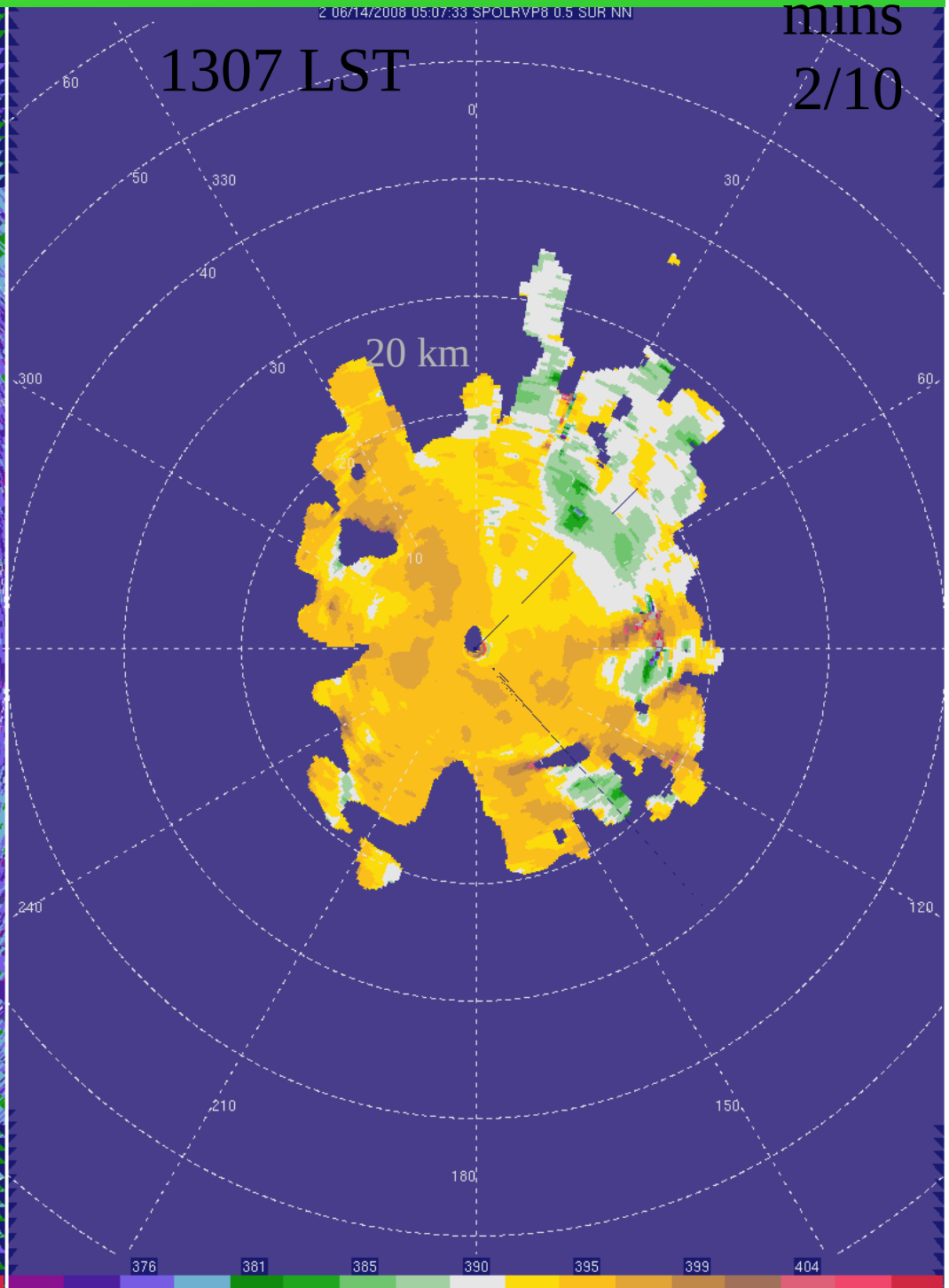
IOP : June 14 :

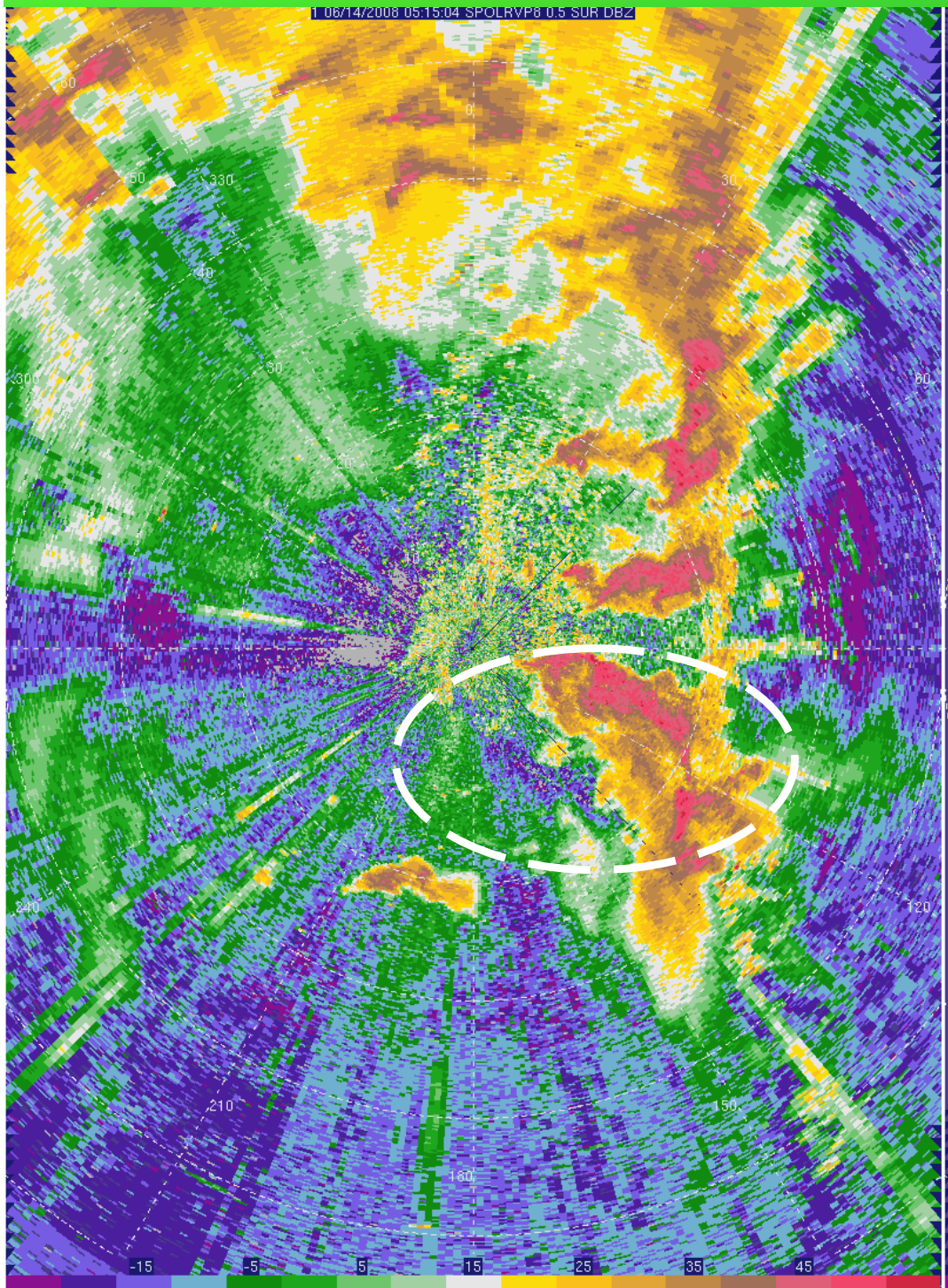
+7.5 mins

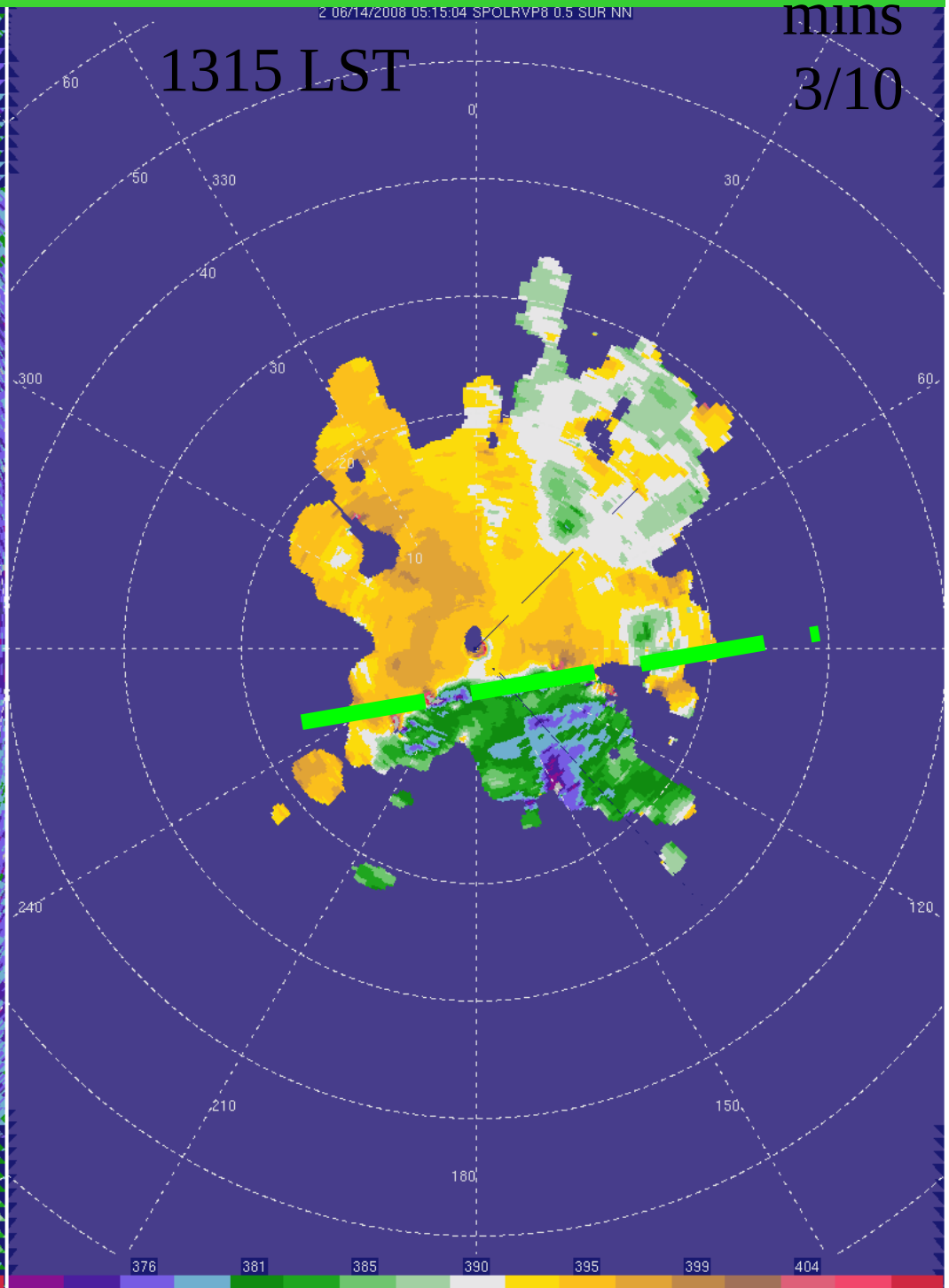




IOP : June 14 : unfavorable environment

+7.5 mins



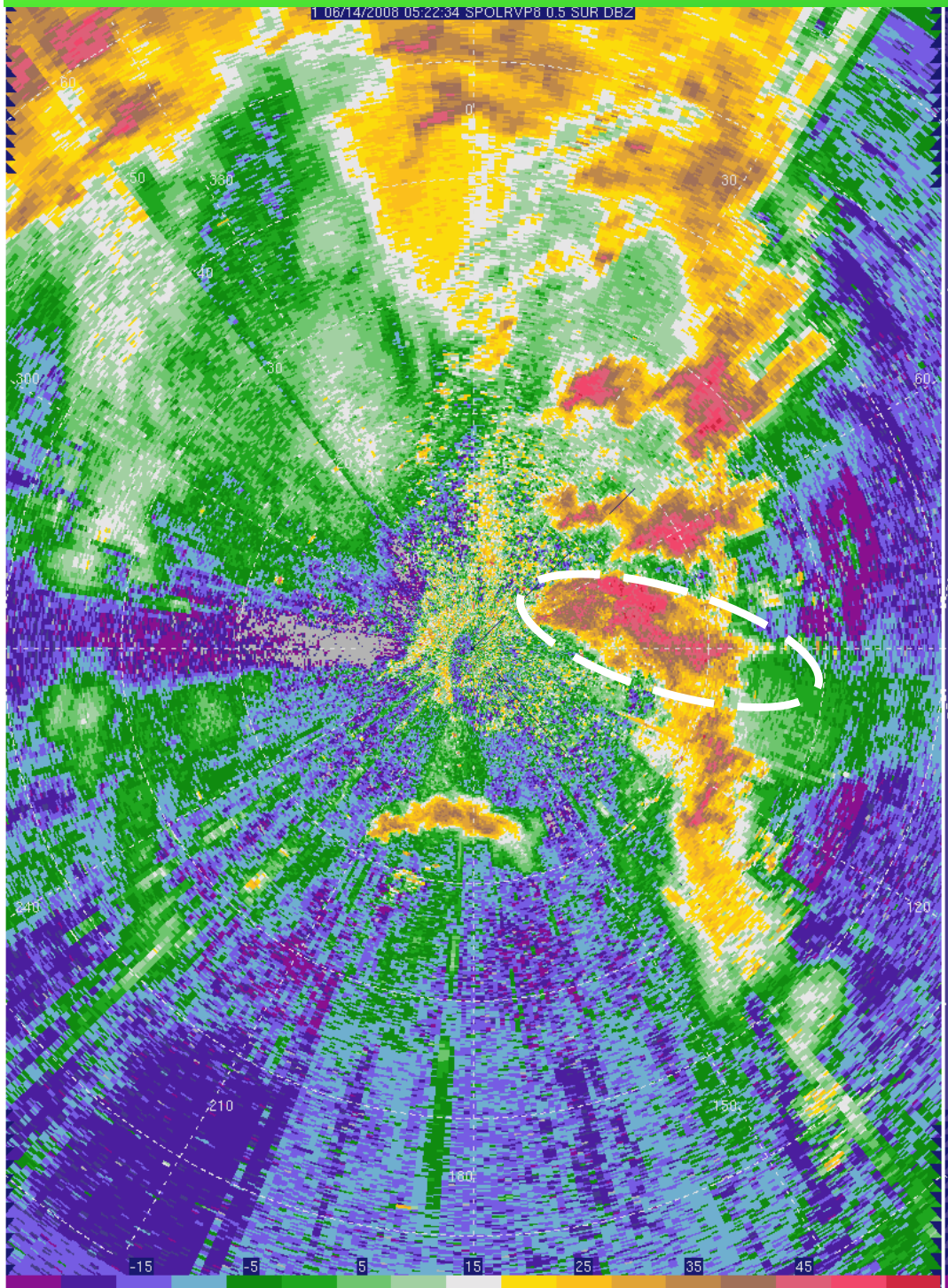


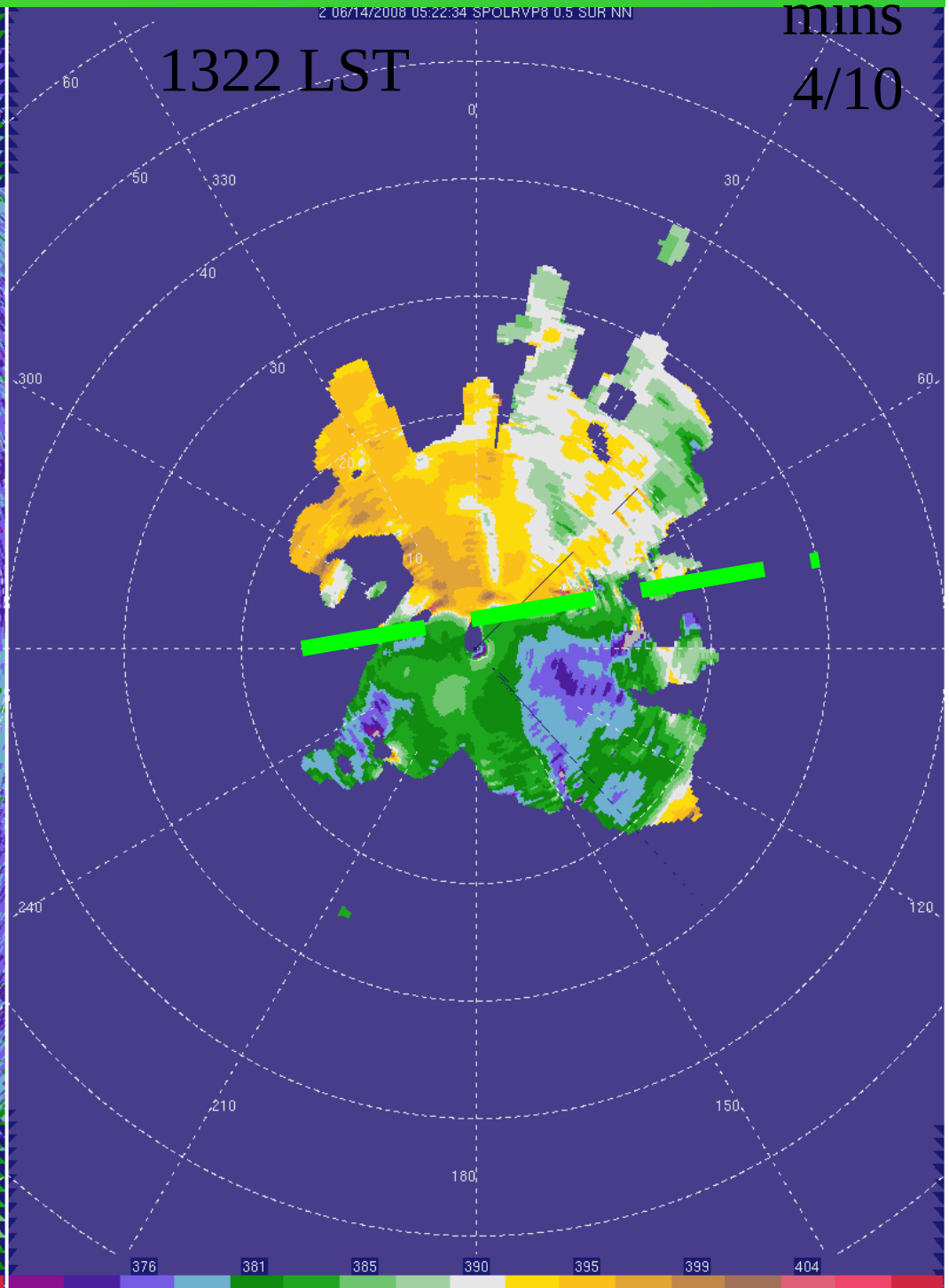
IOP : June 14 : unfavorable environment

+7.5 mins

1322 LST

4/10

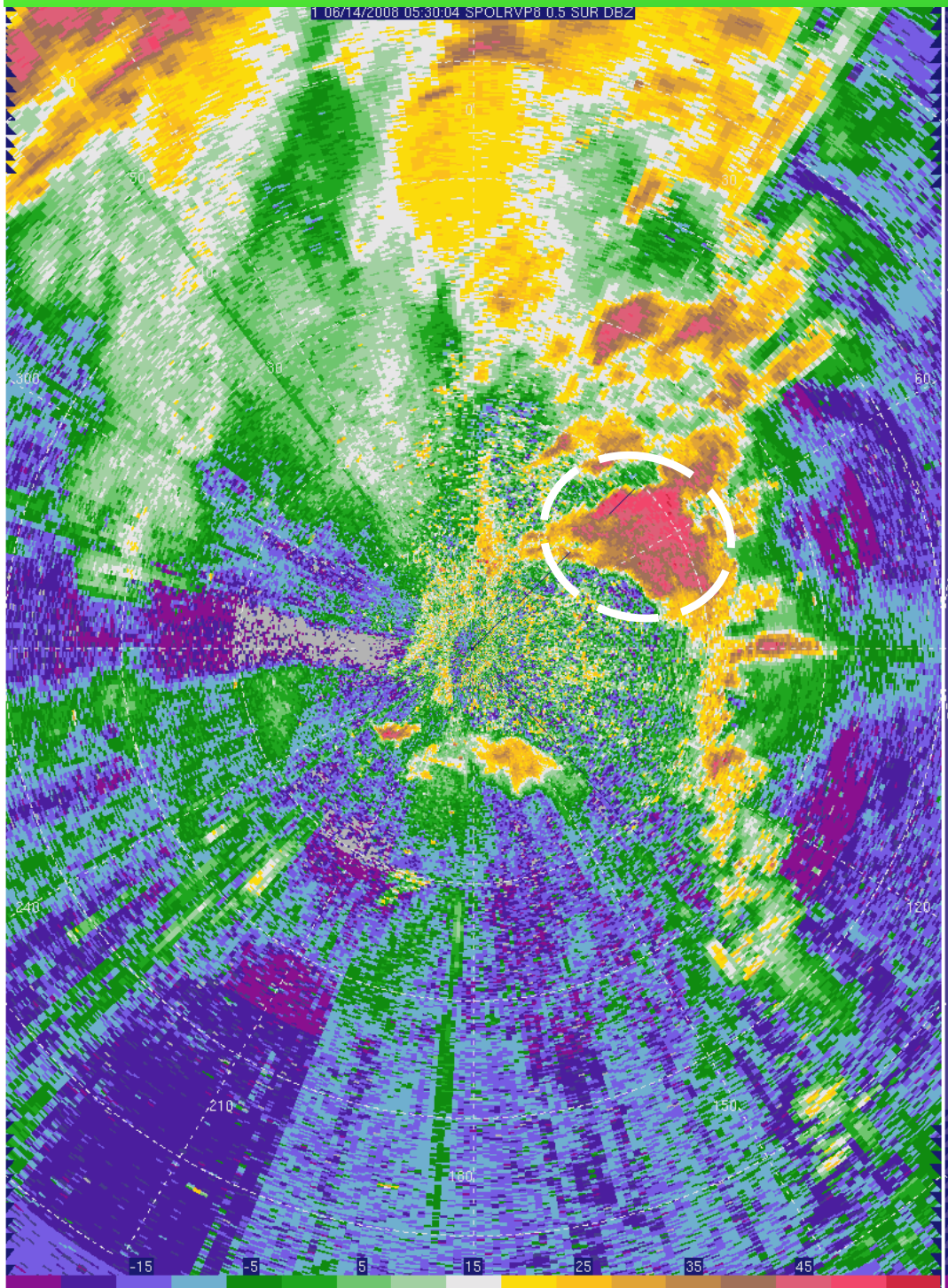


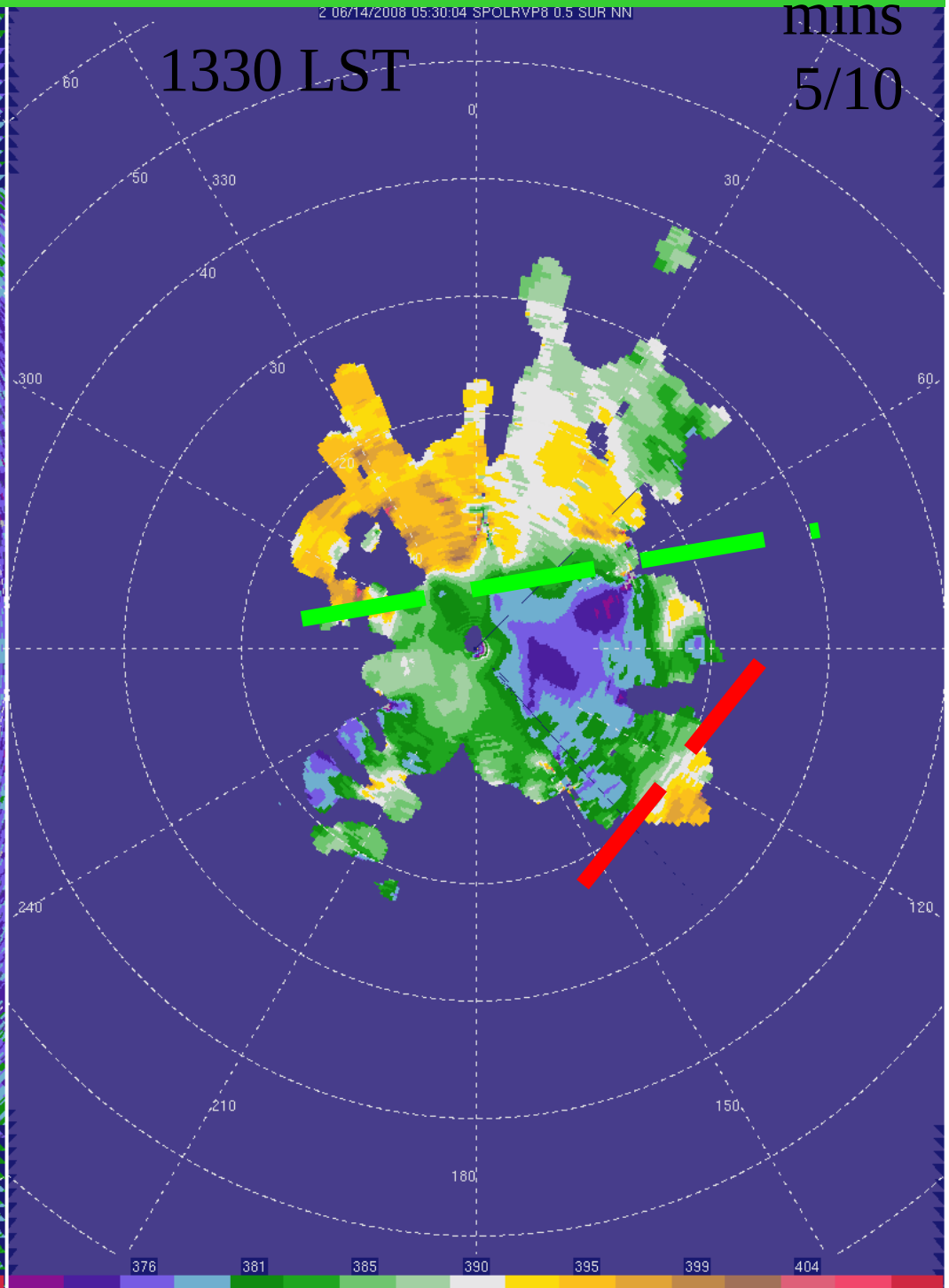


IOP : June 14 : unfavorable environment

+7.5 mins

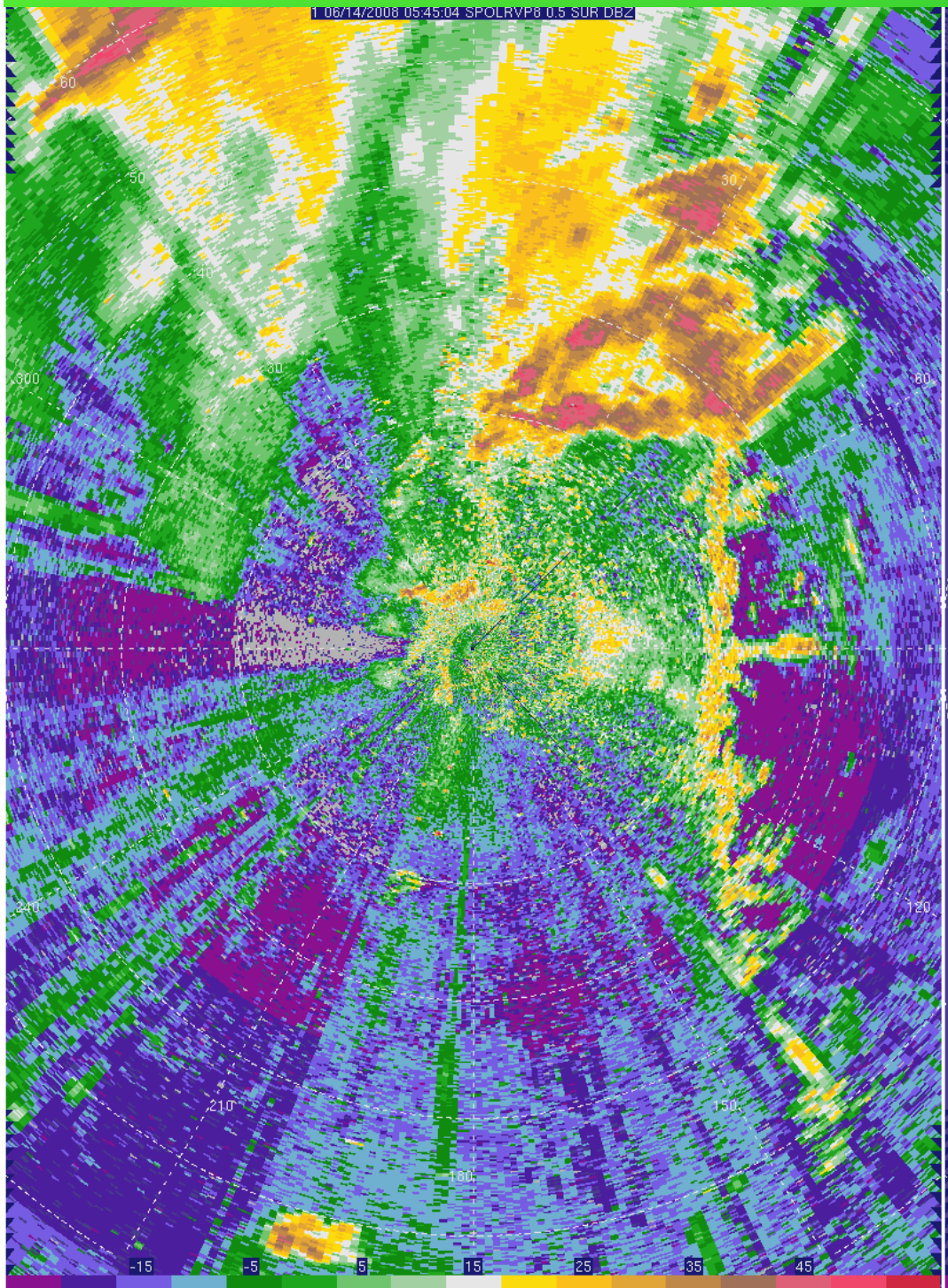
5/10

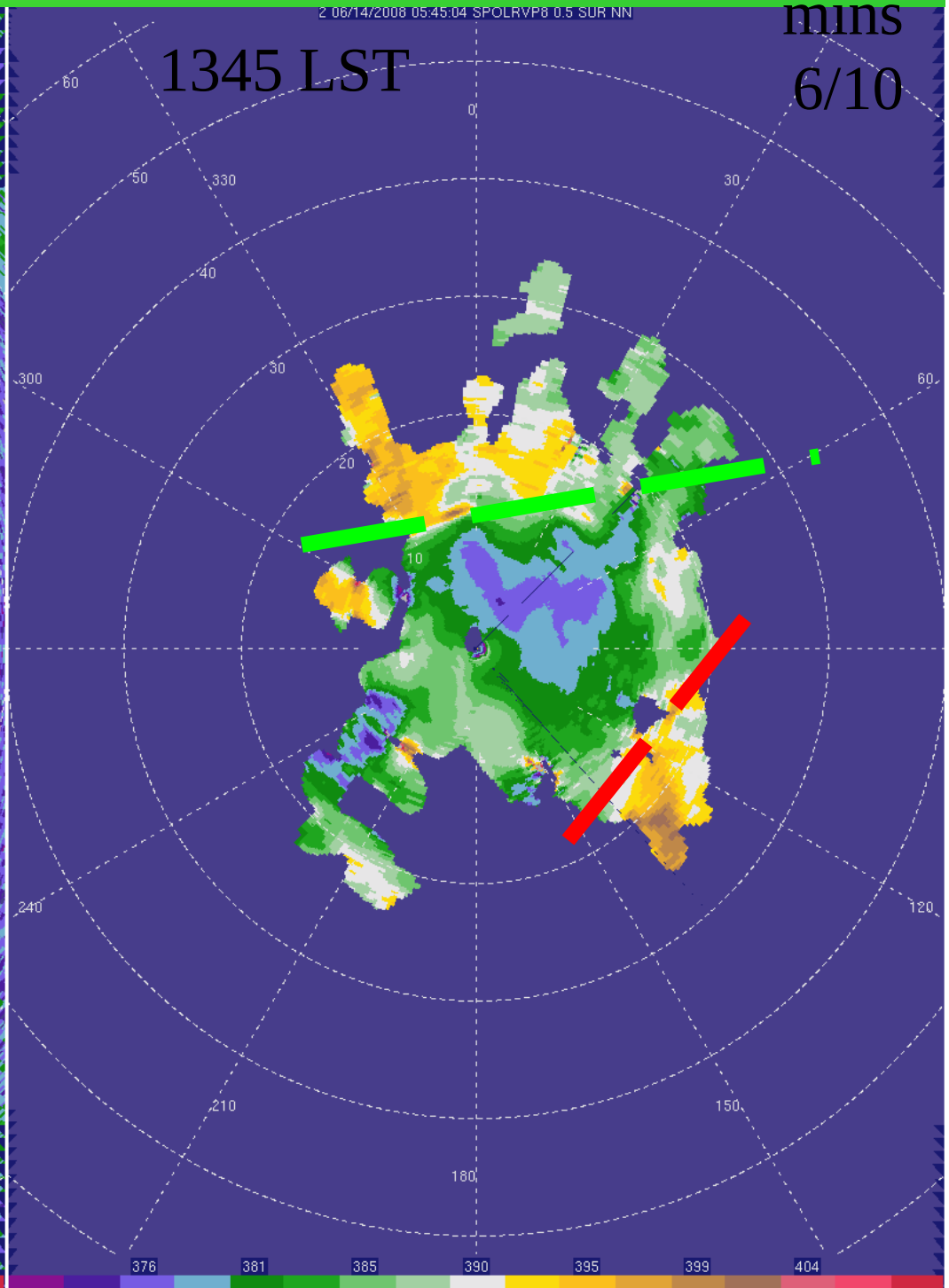




IOP : June 14 : unfavorable environment

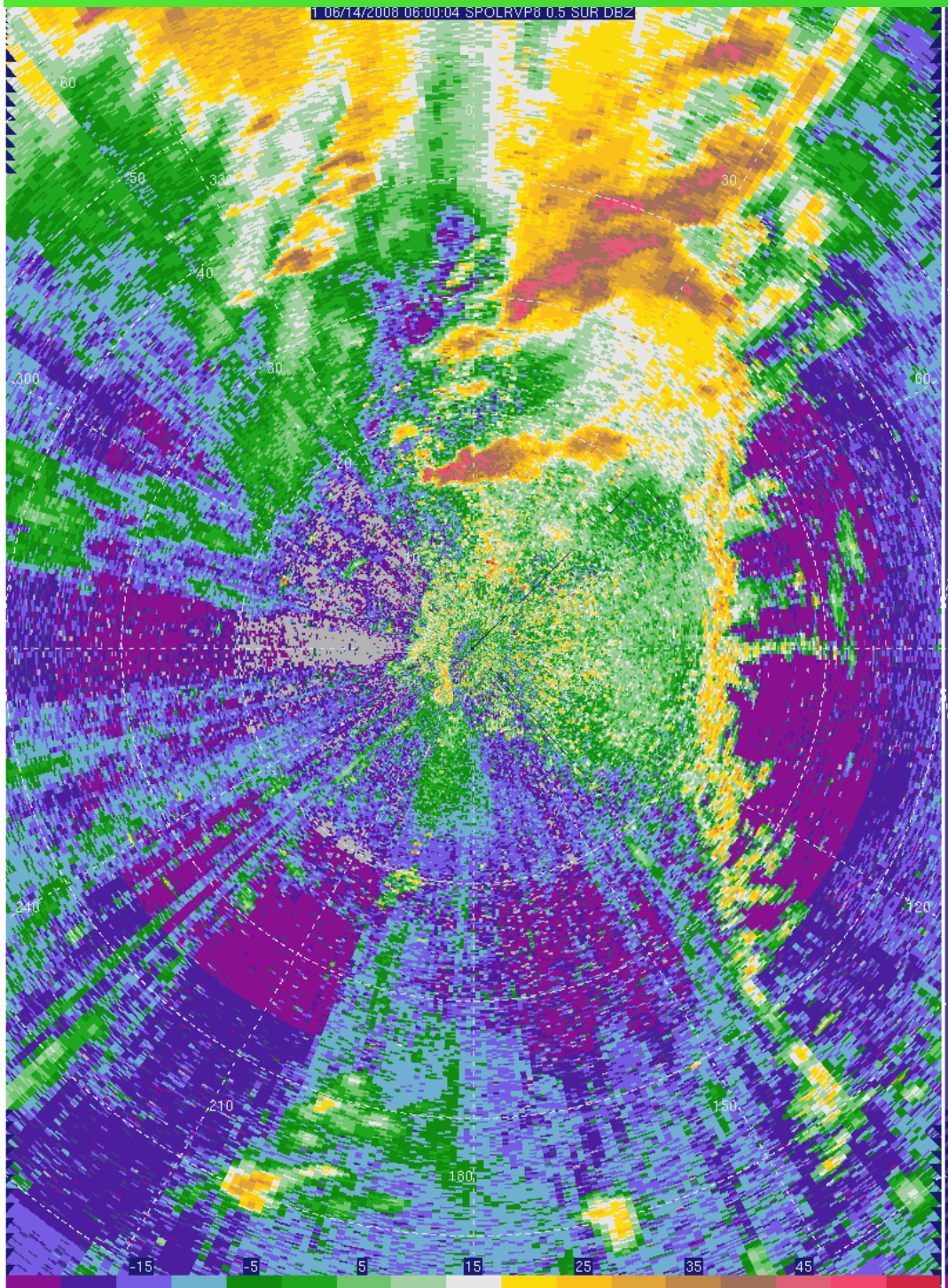
+15 mins 6/10

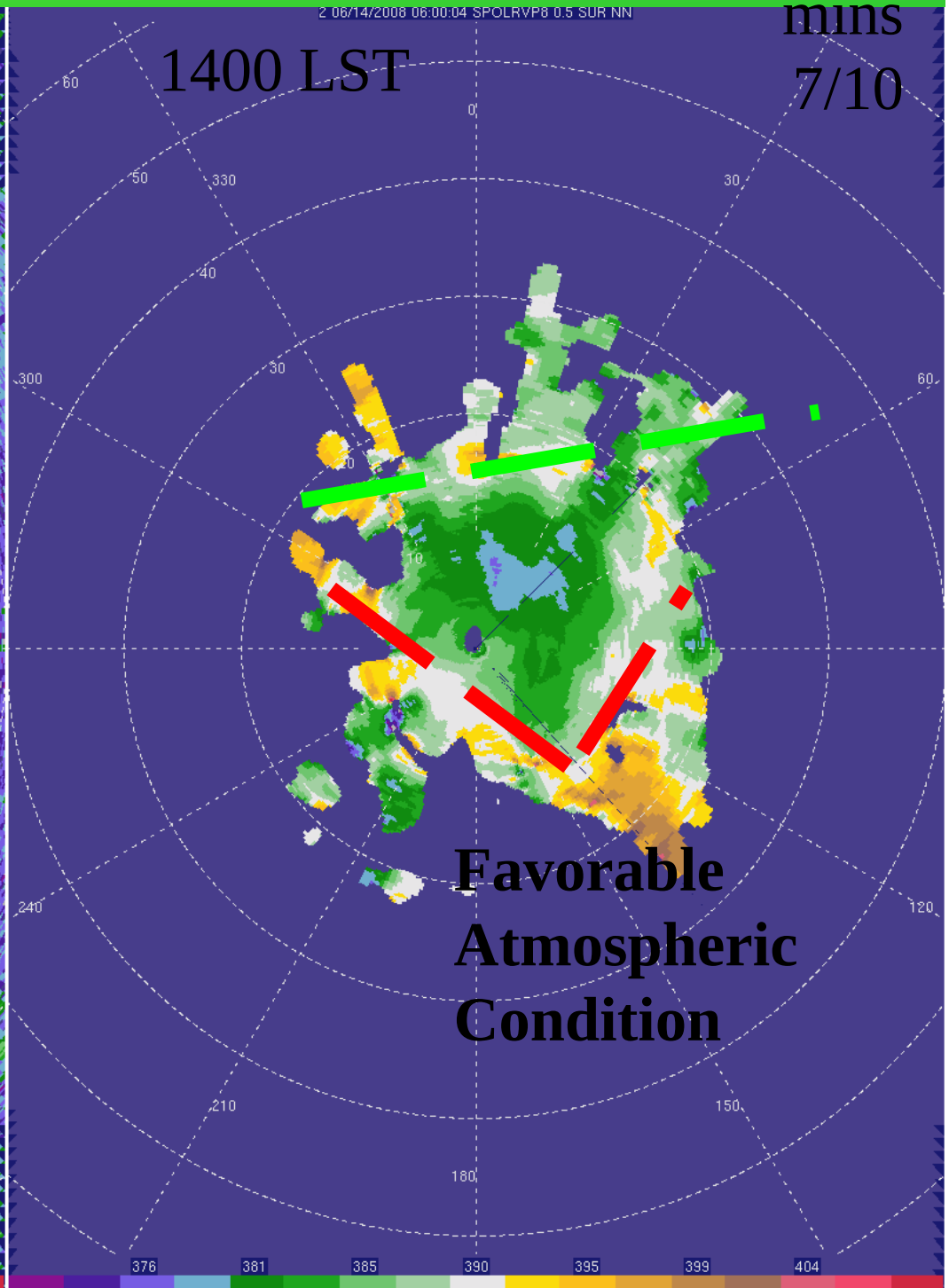




IOP : June 14 : unfavorable/favorable conditions

+15 mins 7/10

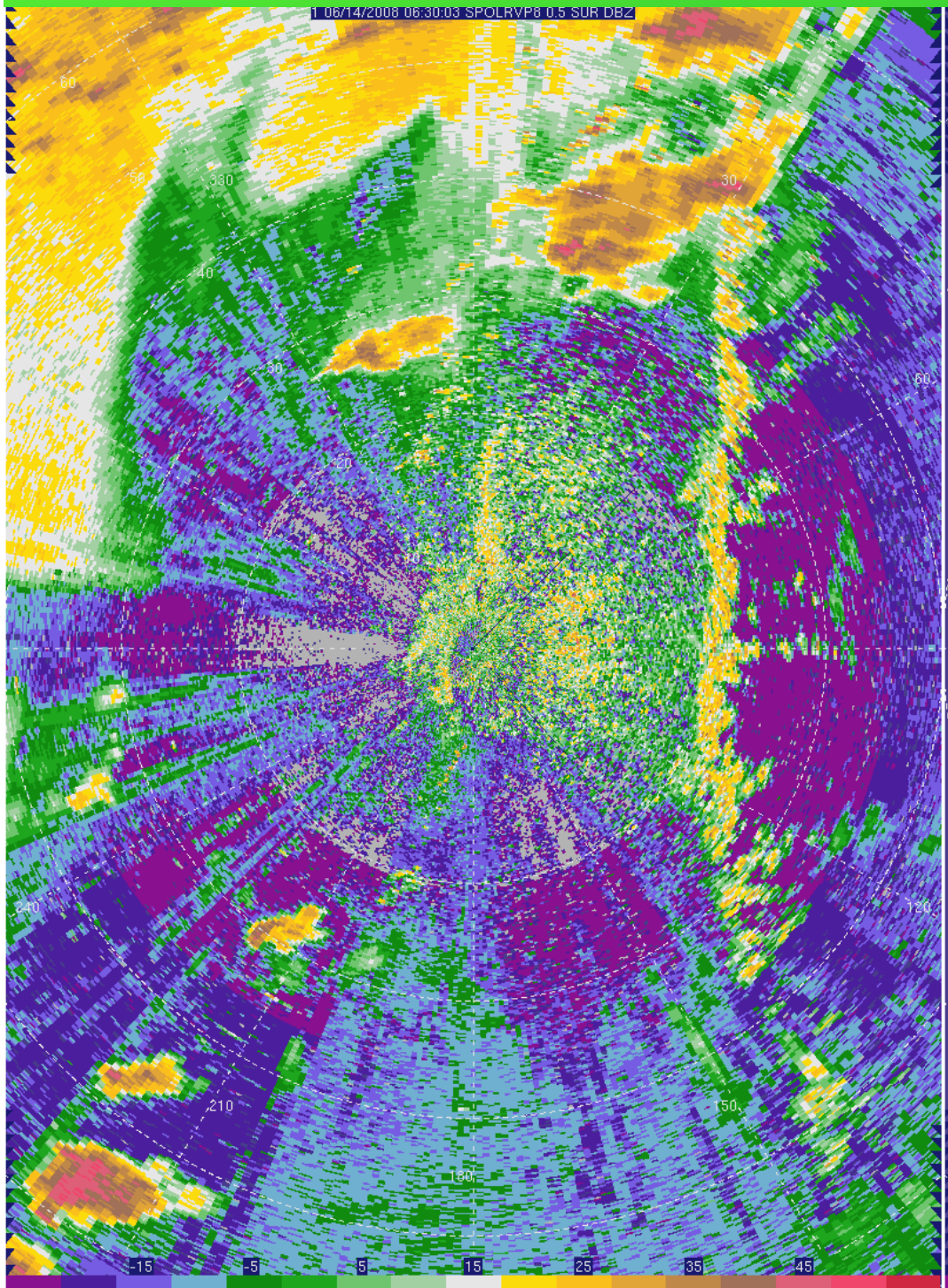


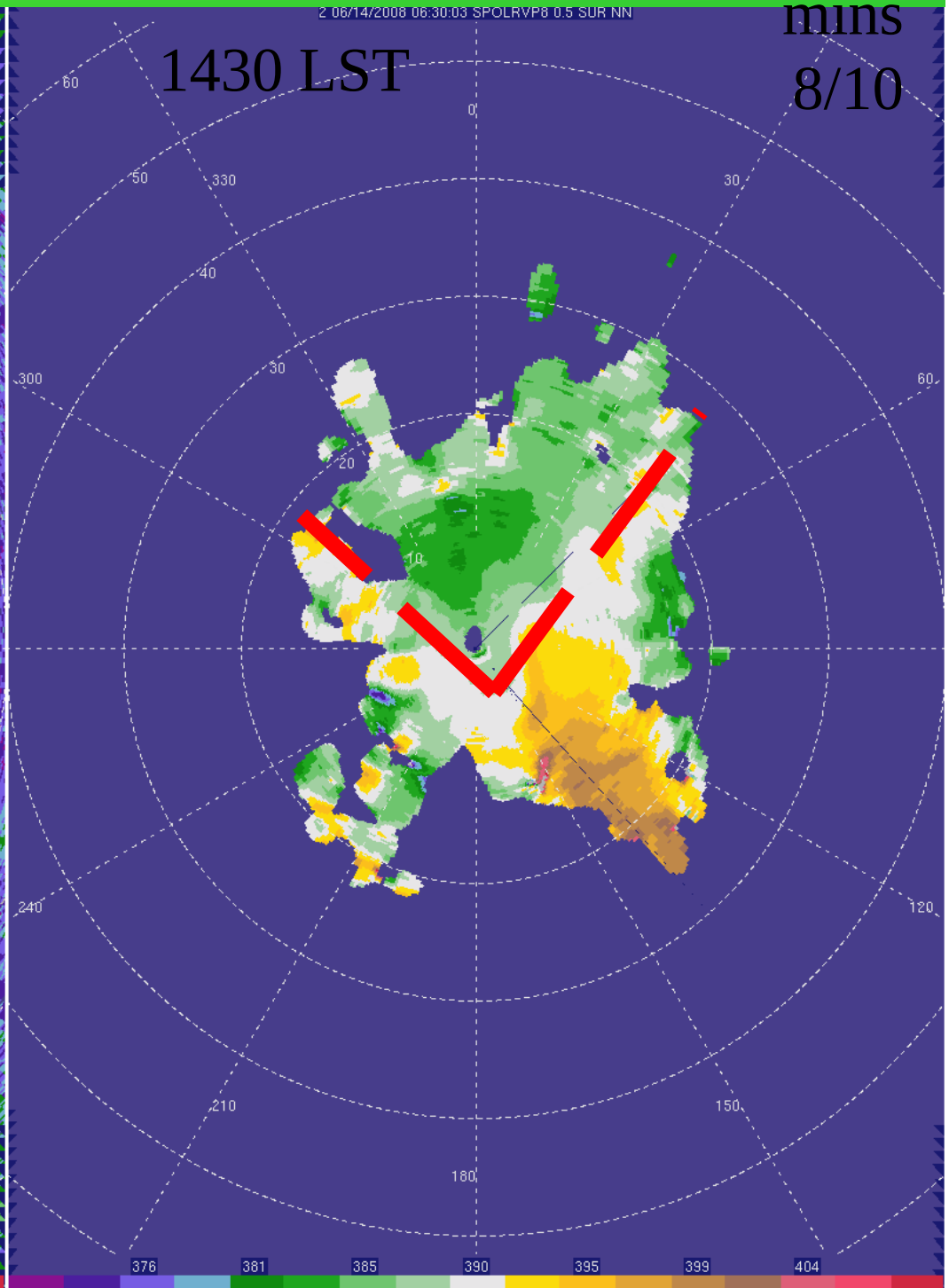


Favorable Atmospheric Condition

IOP : June 14 :

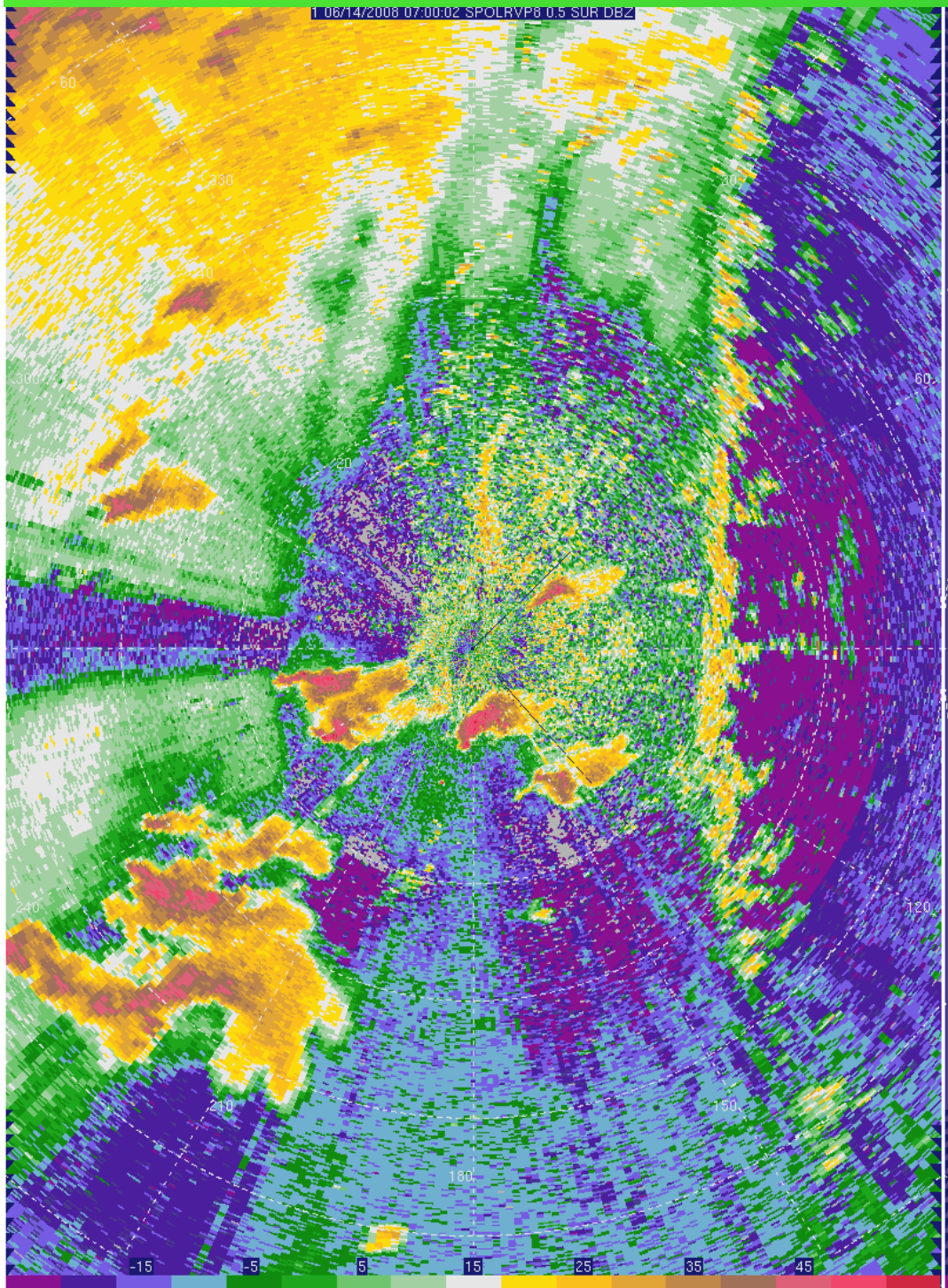
+30 mins

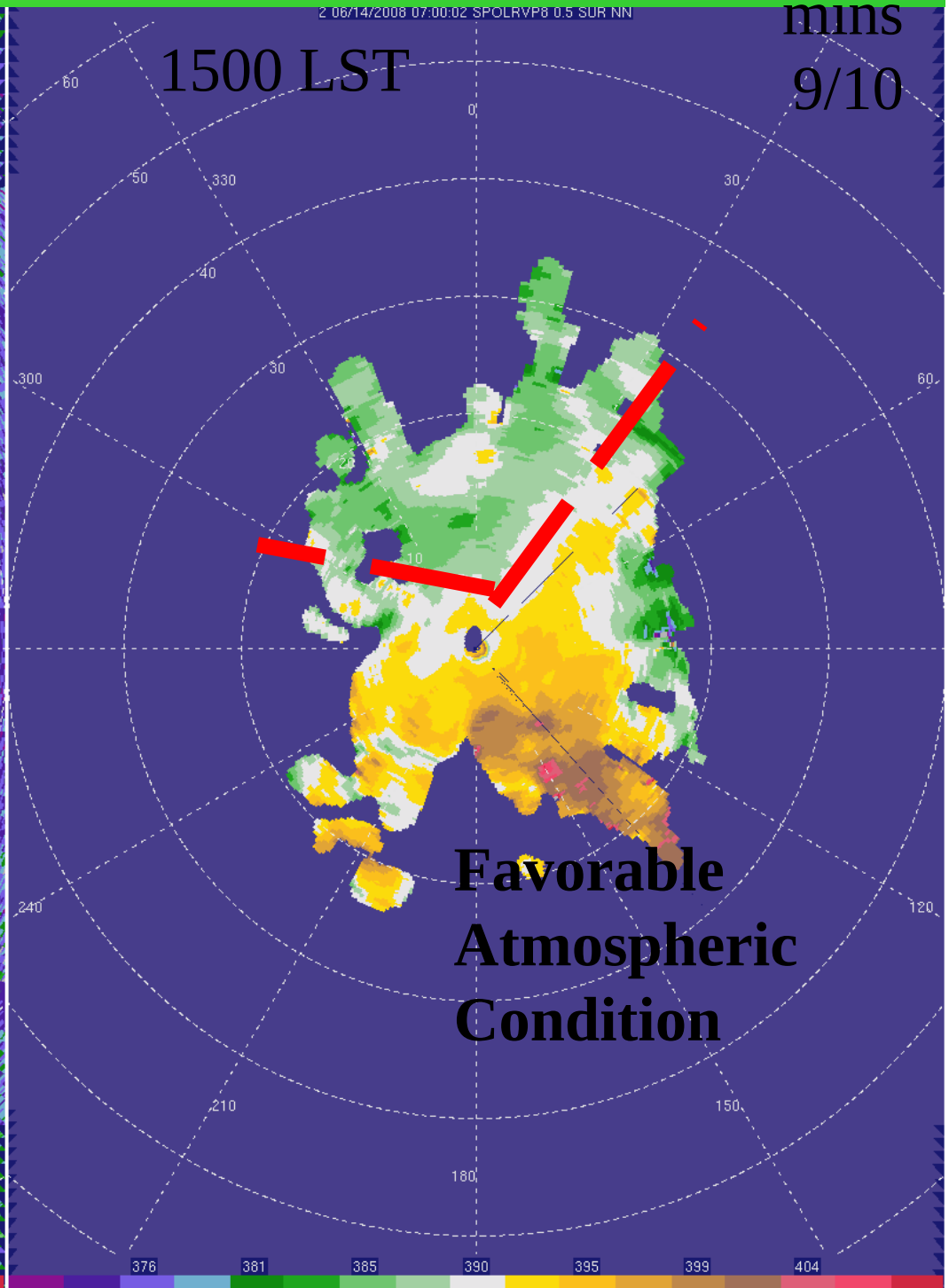




IOP : June 14 :

+30 mins





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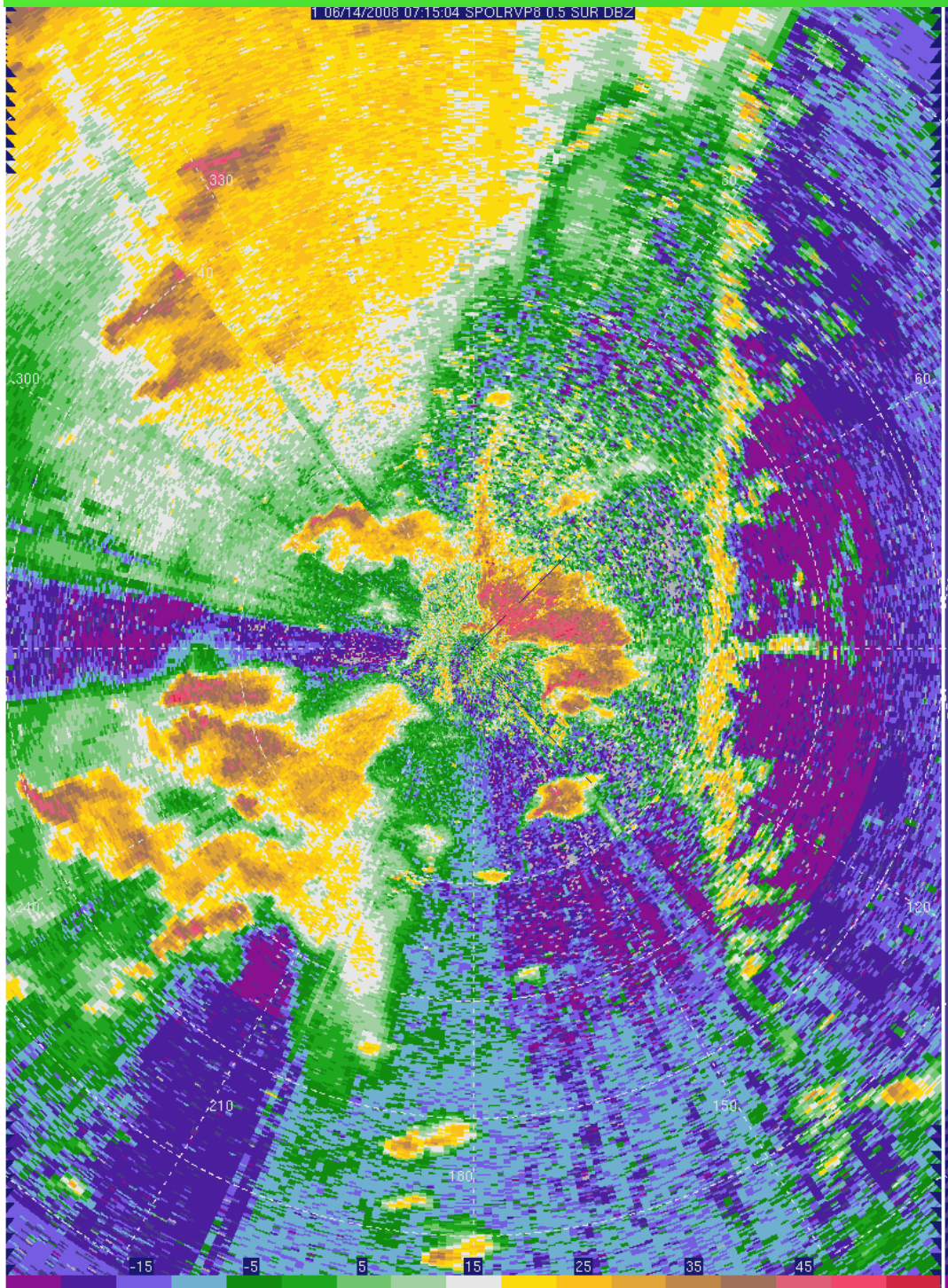
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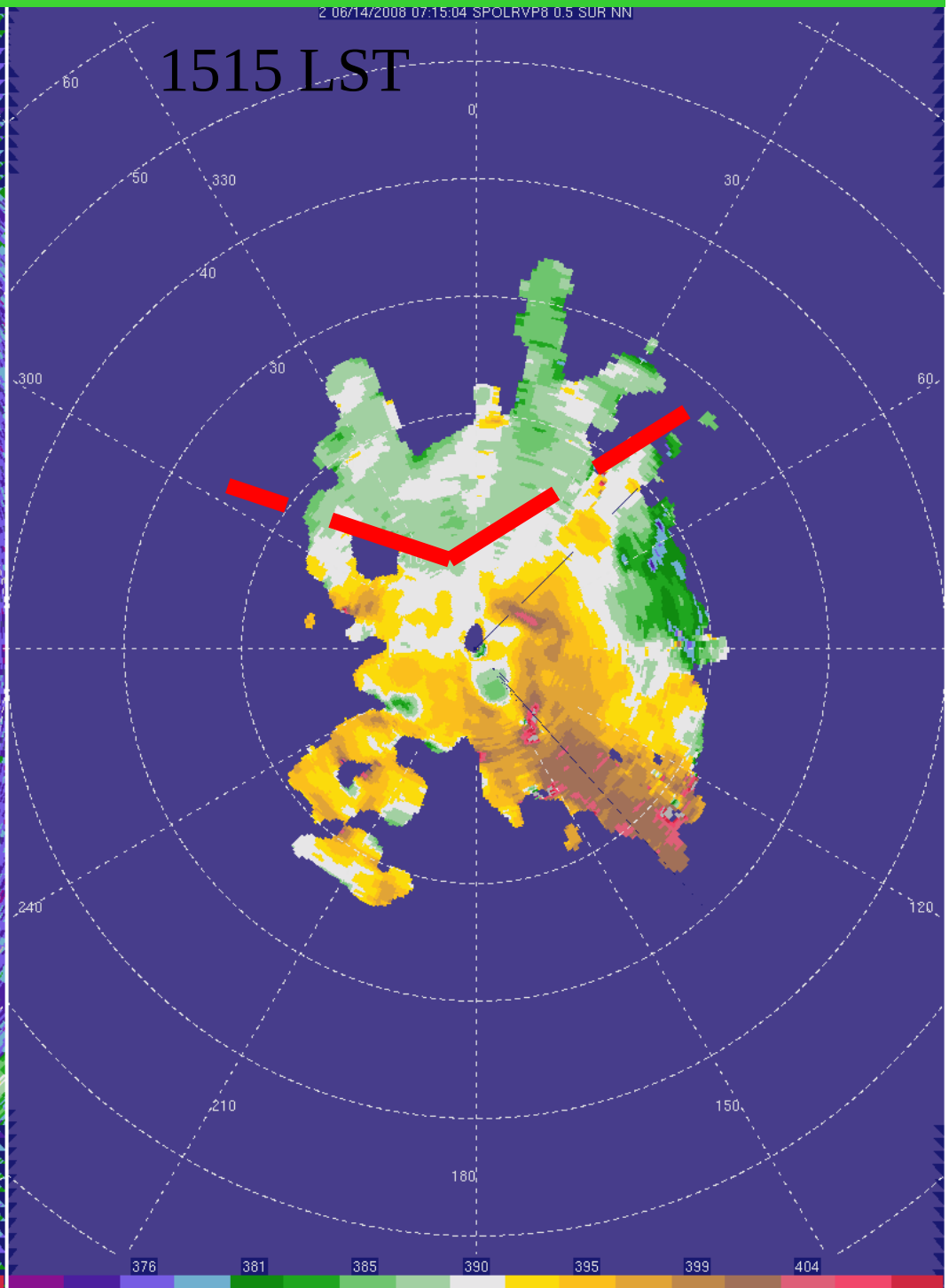
2 06/14/2006 07:15:04 SPOLRVP8 0.5 SUR NN
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Potential Refractivity Applications

- Nowcasting CI (CI in max N regions)
- Monitoring low-level spatial and temporal moisture/temperature variations
- Monitoring SBF and sometimes gust fronts
- Widespread precipitation: N as precursor to further development or dissipation

We invite you to consider if refractivity may be useful for your SoWMEX/TiMREX research