

**Evaluating the New NCEP CFSR Product Against  
ARM IOP Data at the SGP  
(CFSR: Climate Forecast System Reanalysis)**

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**Global, T382 (38 km), 64 levels, at similar  
resolution as NARR**

**with hourly data**

**1979-present**

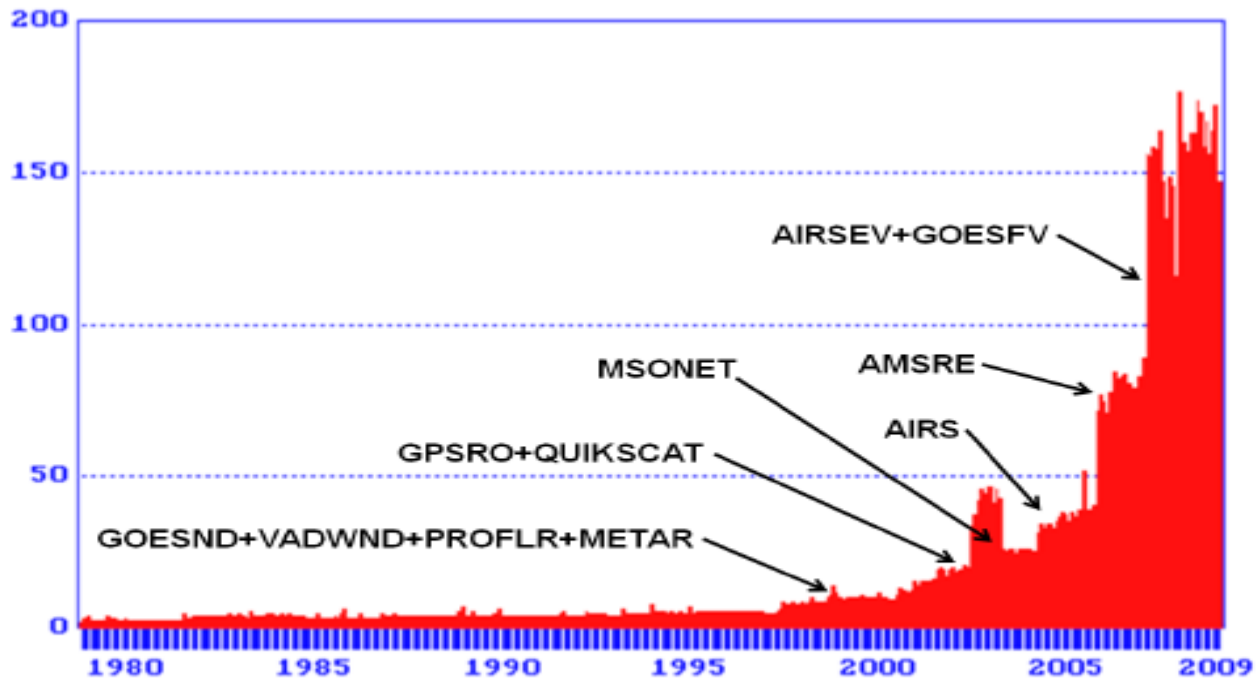


Figure 1: Diagram illustrating CFSR data dump volumes, 1978-2009, in Gb/month.

**NCEP Global Forecast System (GFS)**

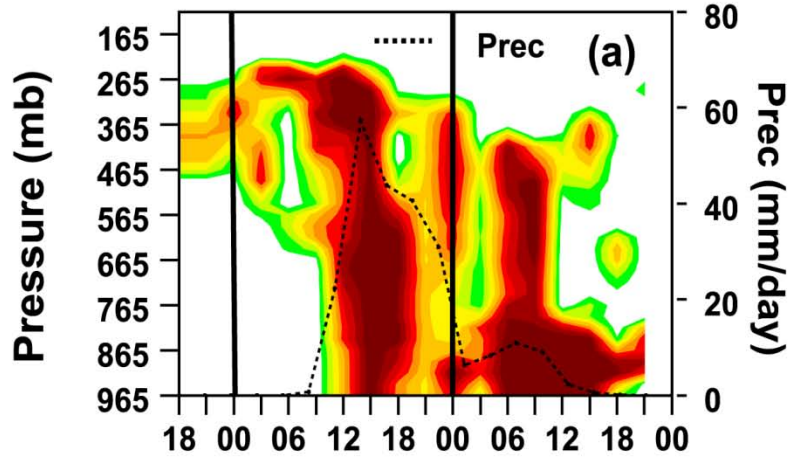
**+**

**Gridpoint Statistical Interpolation (GSI)  
(3-DVAR)**

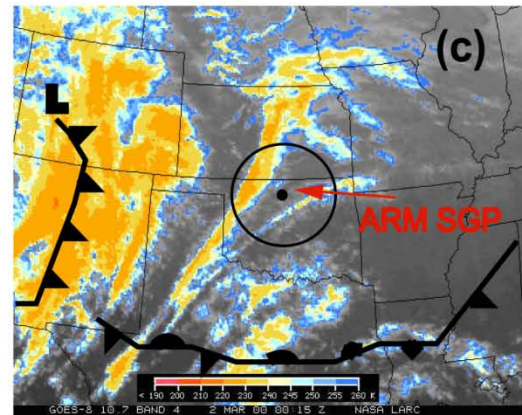
**Observed surface precipitation is used as  
input to the land surface model**

# **The ARM SGP March 2000 IOP**

### Cloud Frequency (%)

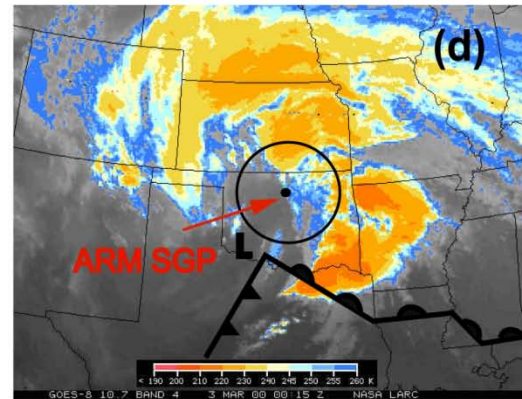
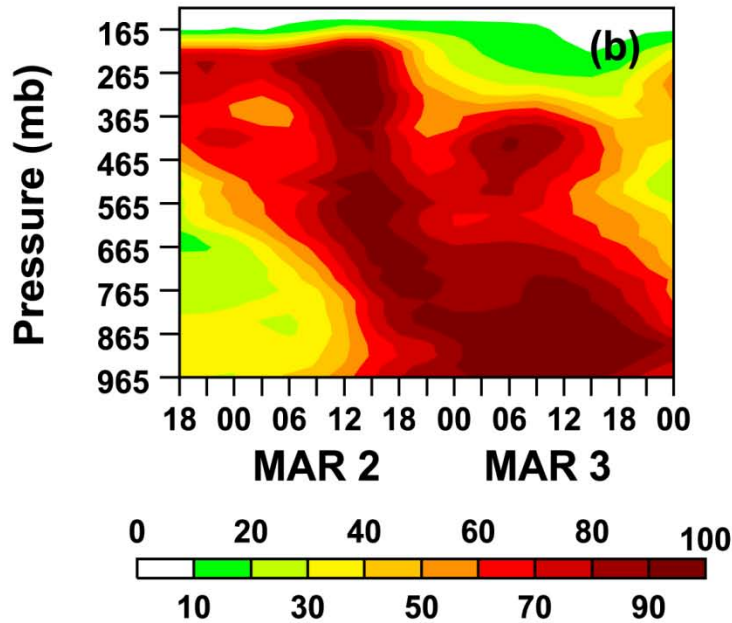


### GOES Image

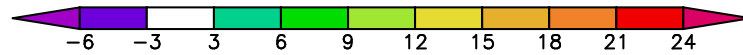
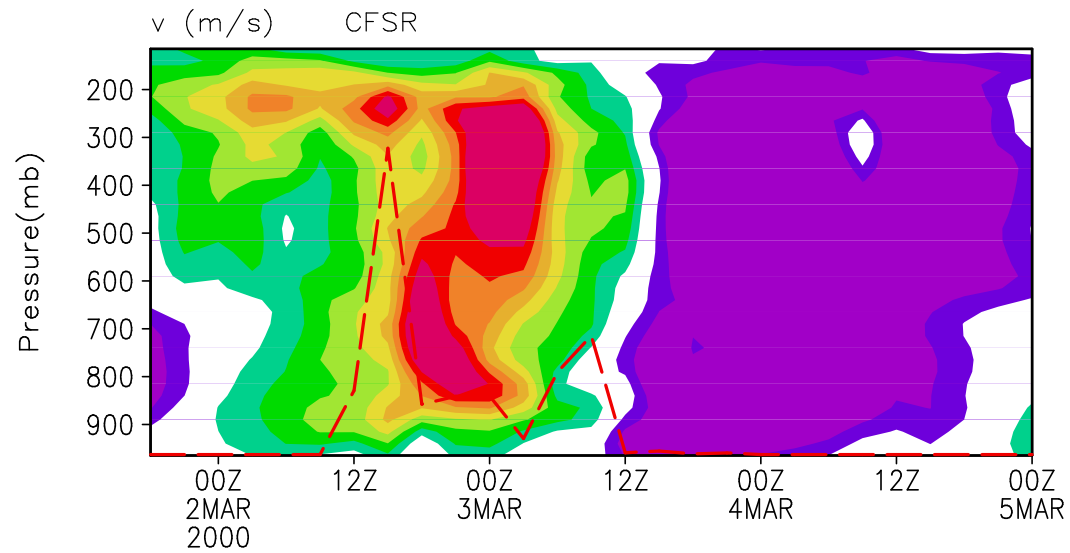
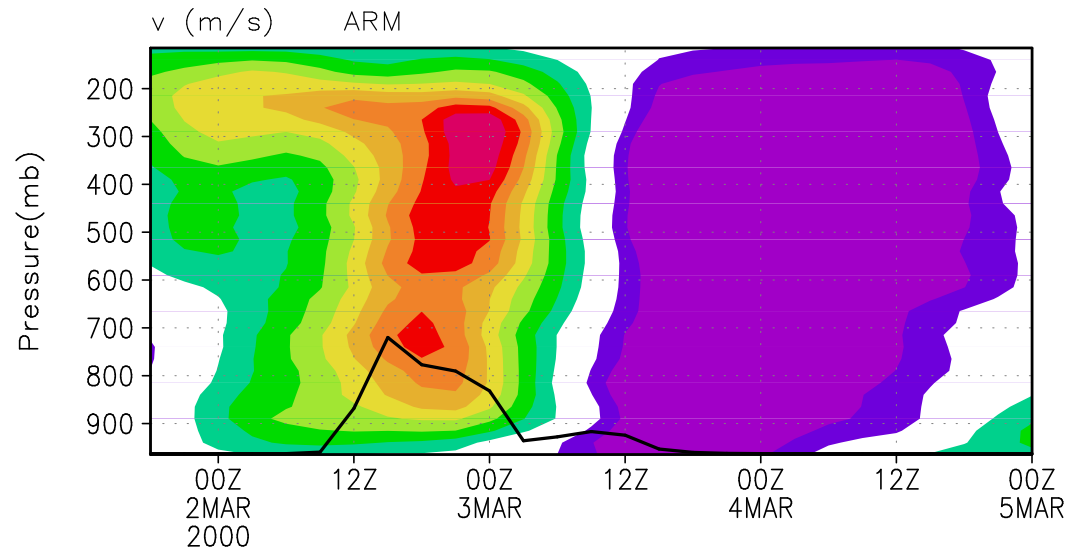


00Z 2 March, 2000

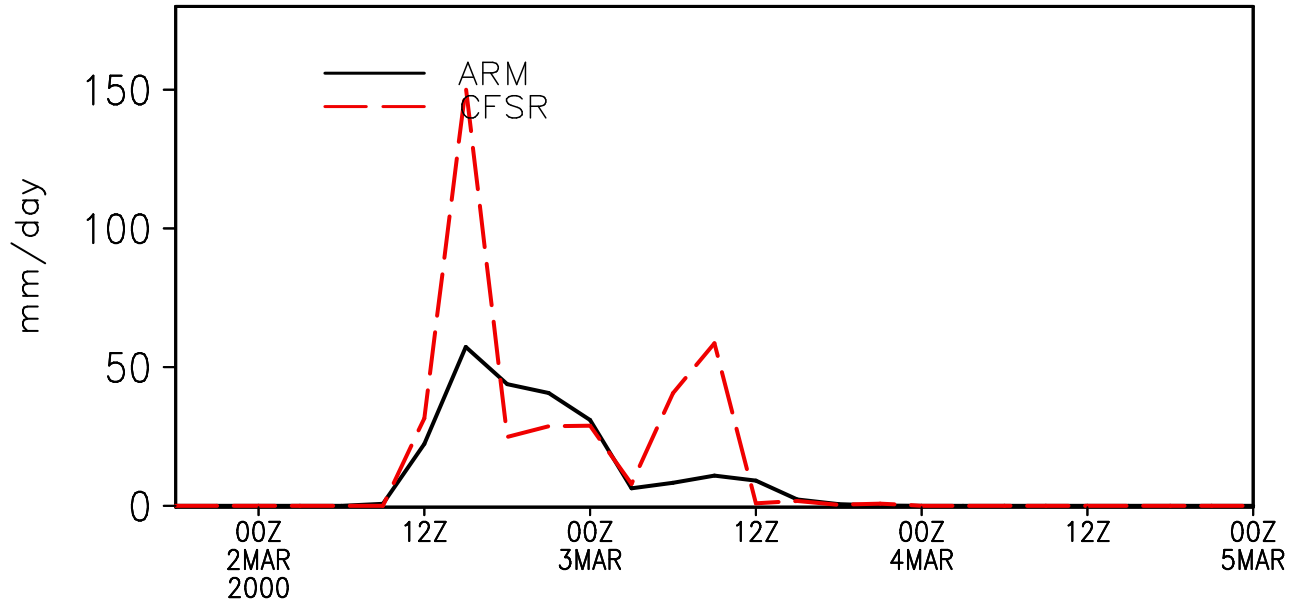
### Relative Humidity (%)

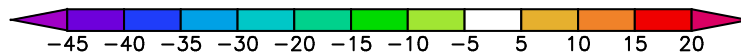
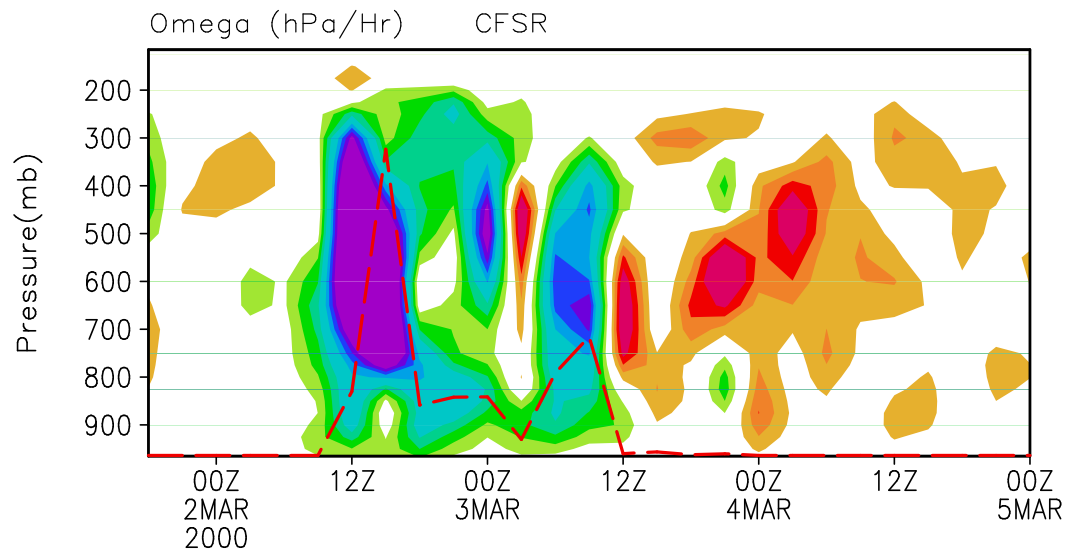
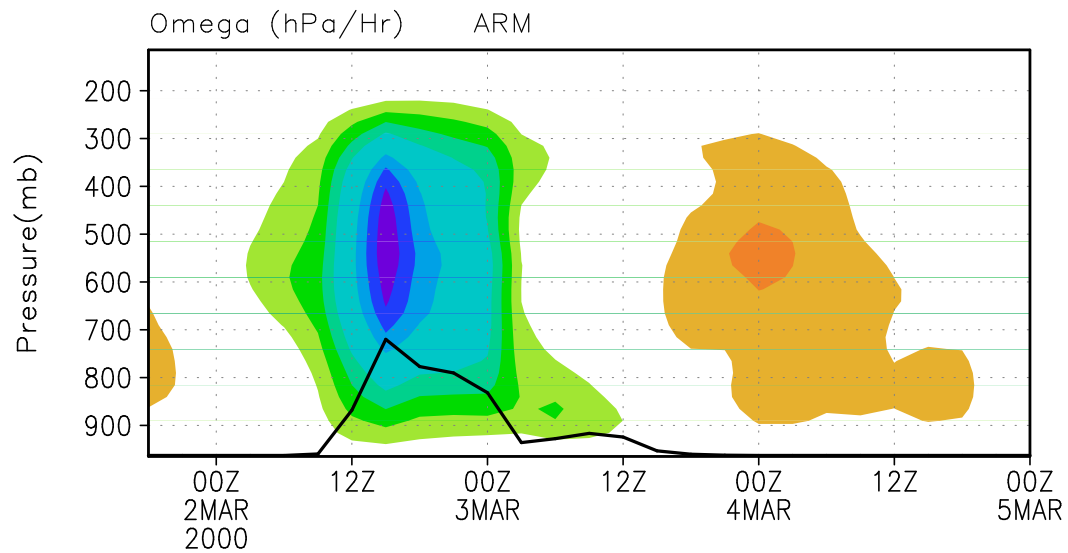


00Z 3 March, 2000



Precipitation rate

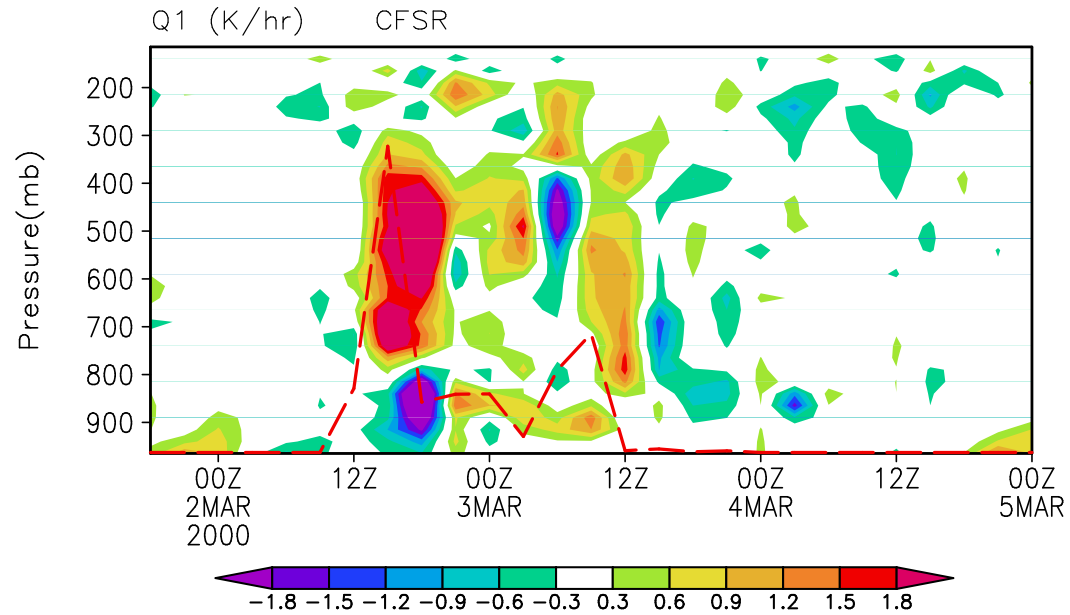
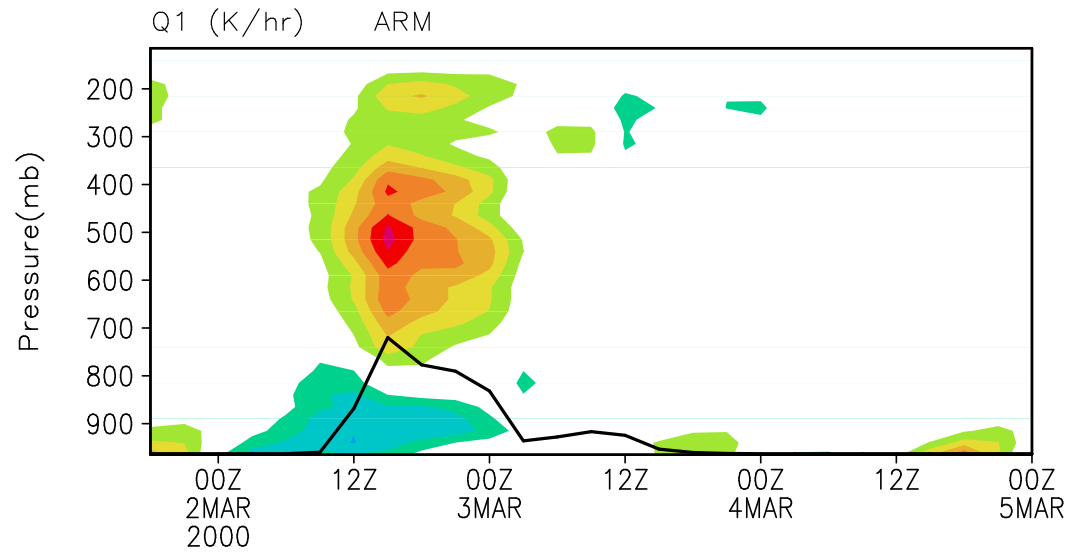


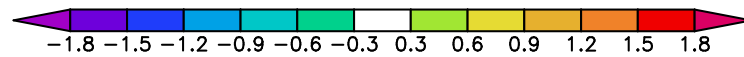
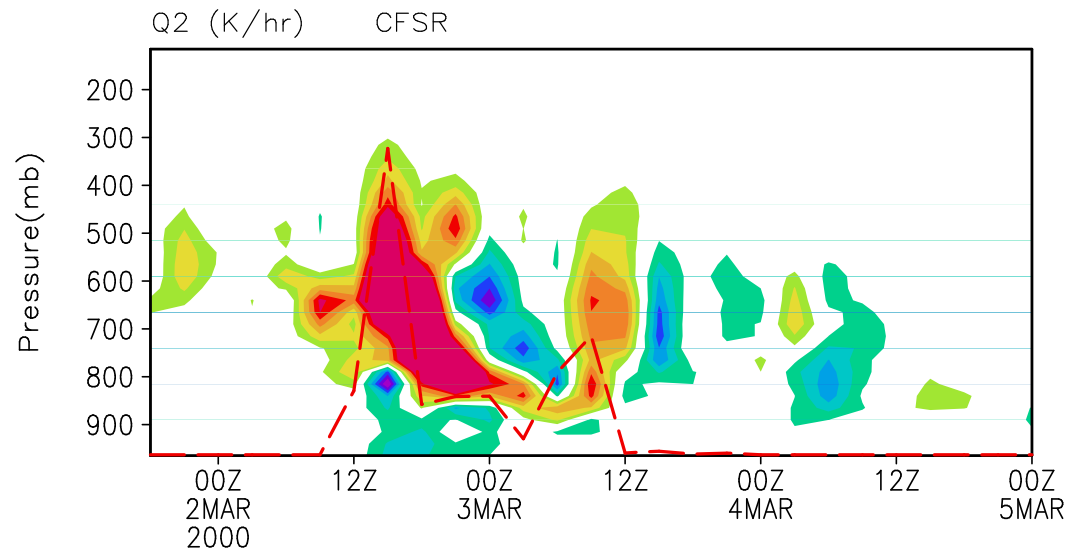
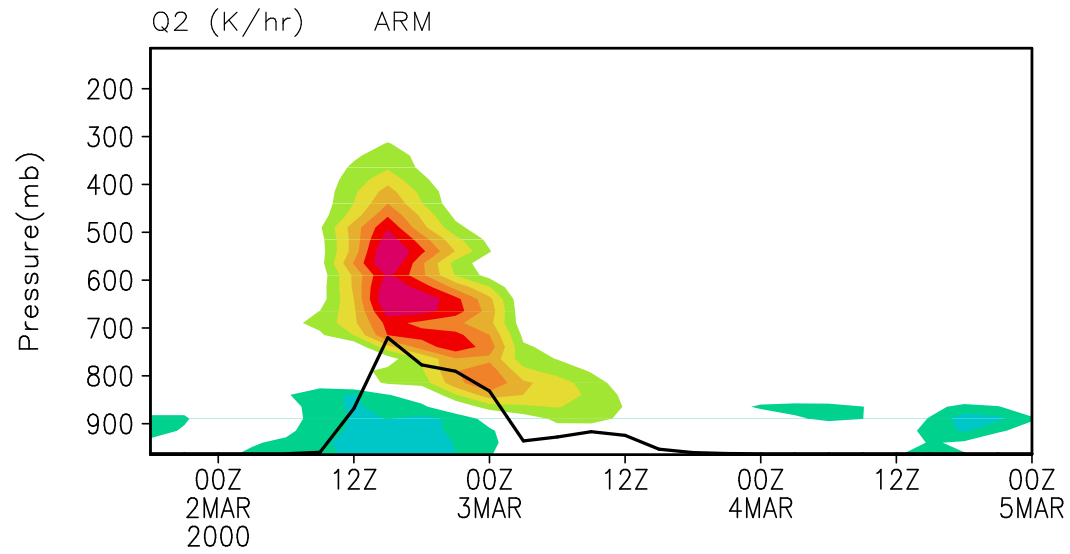




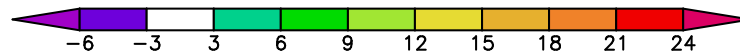
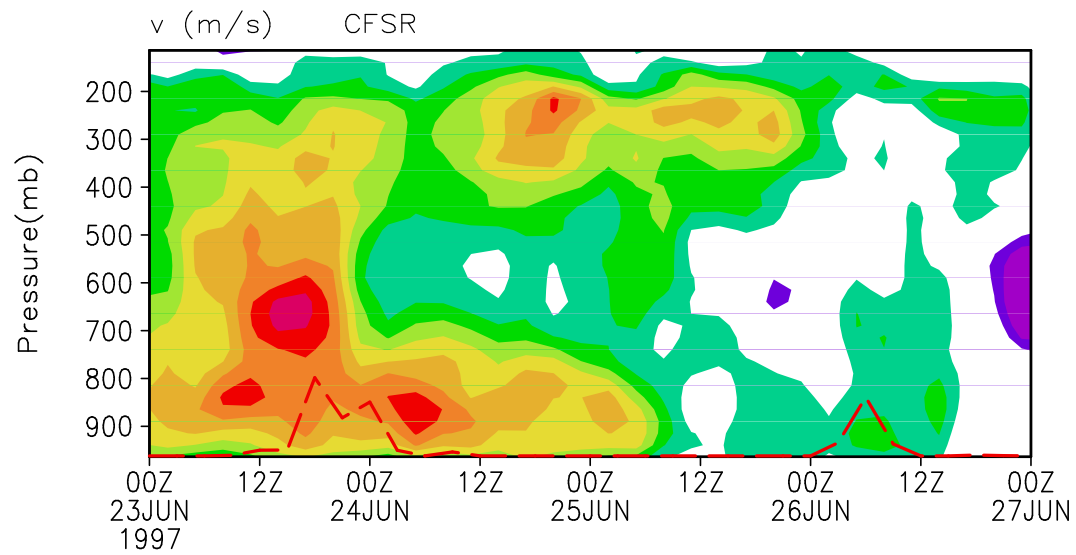
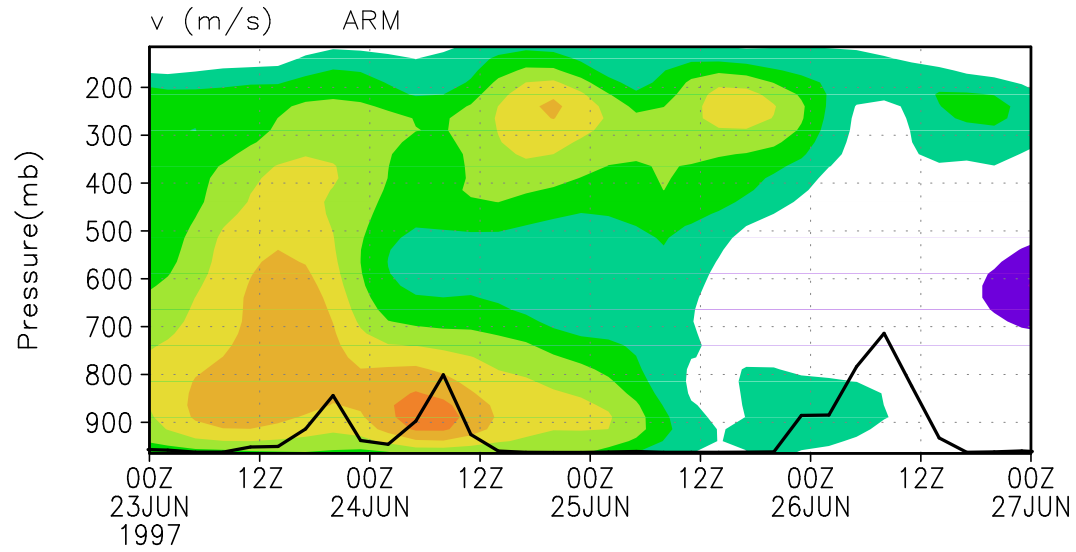
$$\frac{\partial \bar{s}}{\partial t} + \bar{V} \cdot \nabla \bar{s} + \bar{\omega} \frac{\partial \bar{s}}{\partial p} = Q_1 = Q_{rad} + L_v (c - e) - \overline{\frac{\partial \omega' s'}{\partial p}}$$

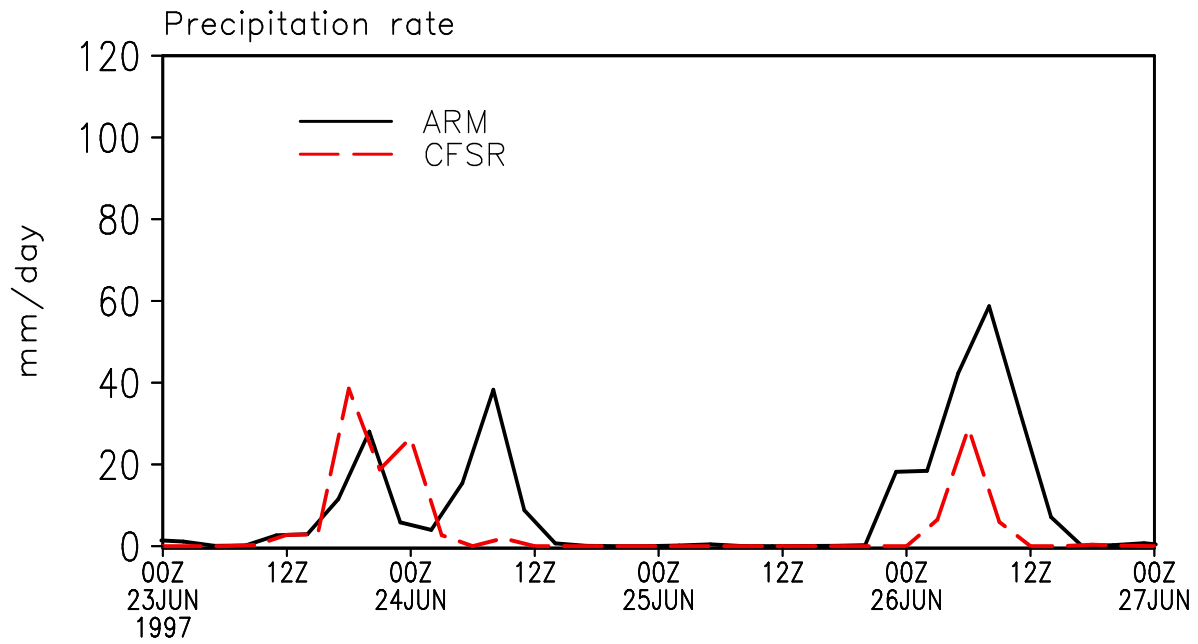
$$\frac{\partial \bar{q}}{\partial t} + \bar{V} \cdot \nabla \bar{q} + \bar{\omega} \frac{\partial \bar{q}}{\partial p} = -Q_2 / L_v = -(c - e) - \overline{\frac{\partial \omega' q'}{\partial p}}$$

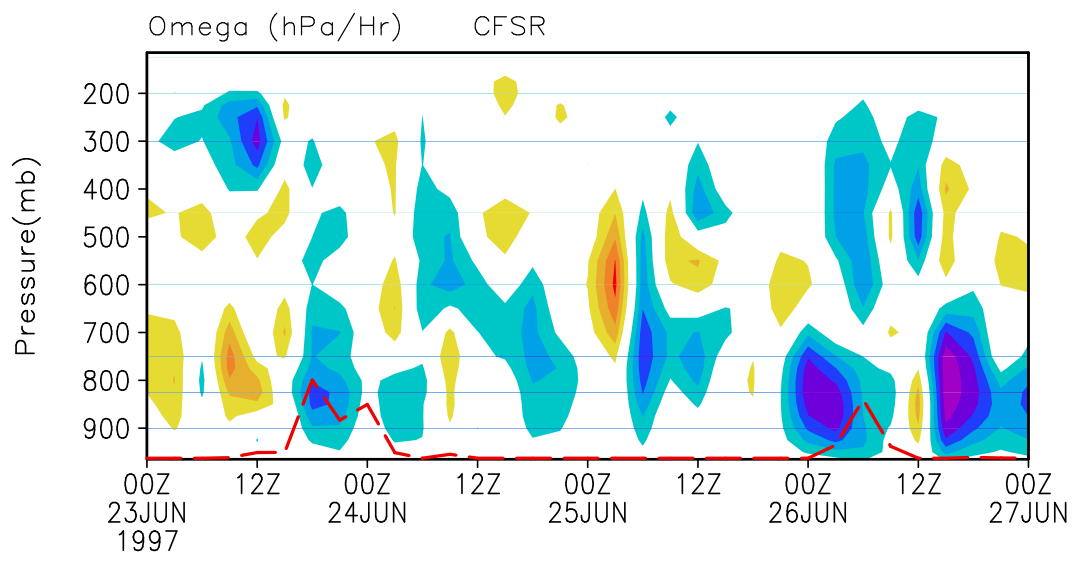
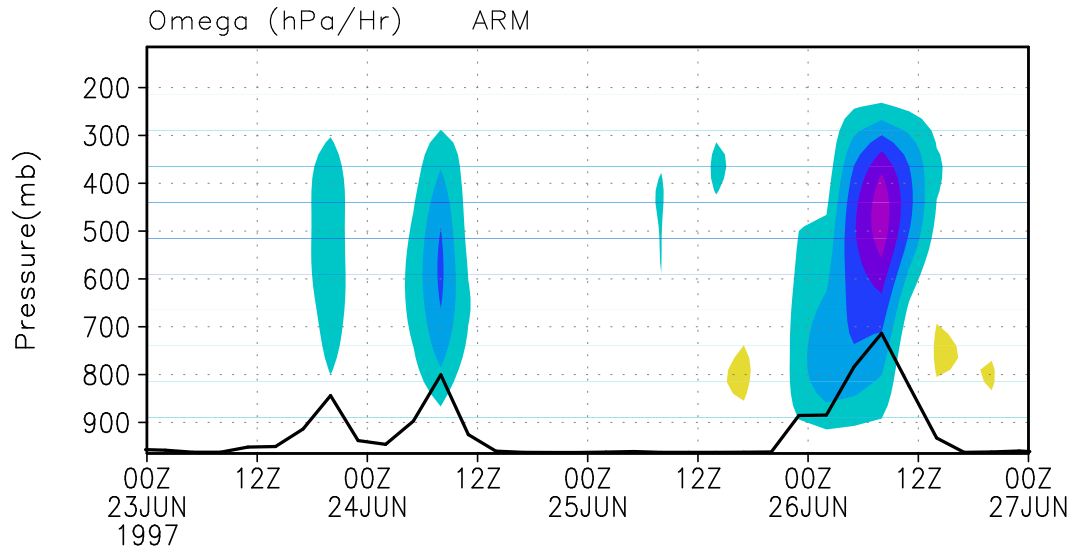


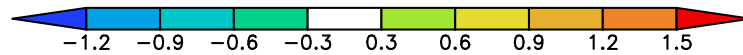
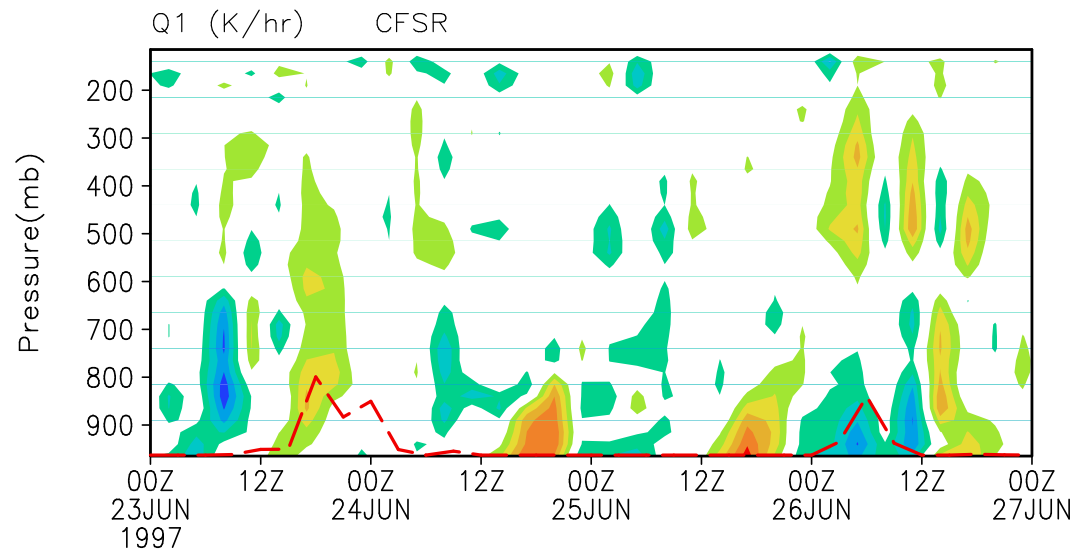
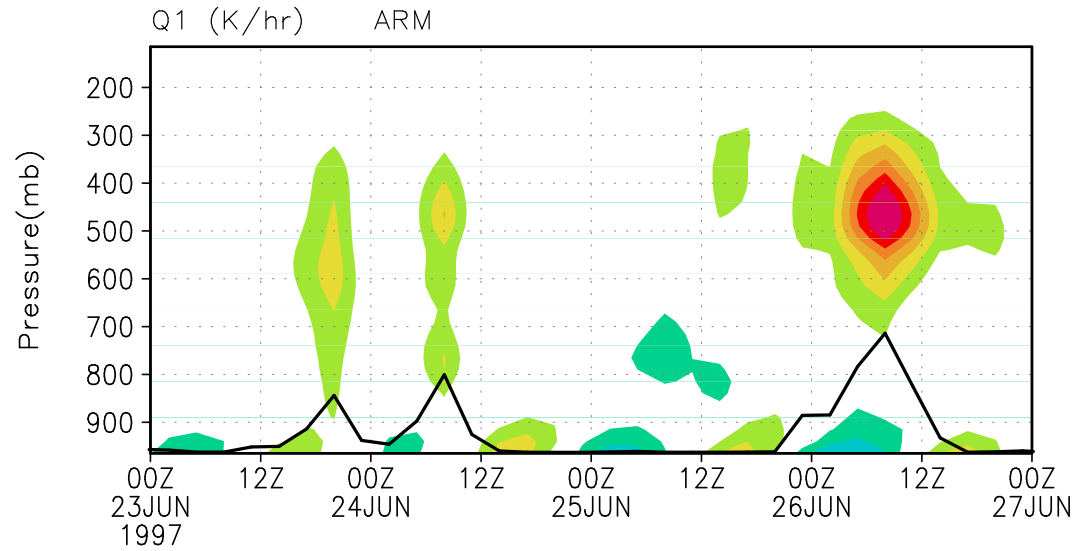


# **The ARM SGP Summer 1997 SCM IOP**

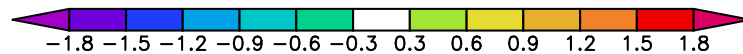
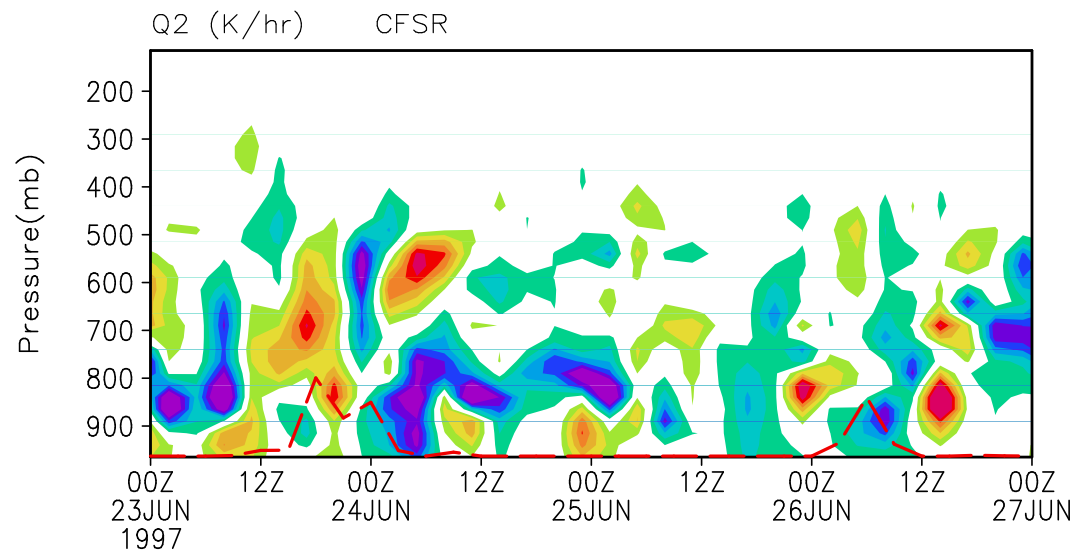
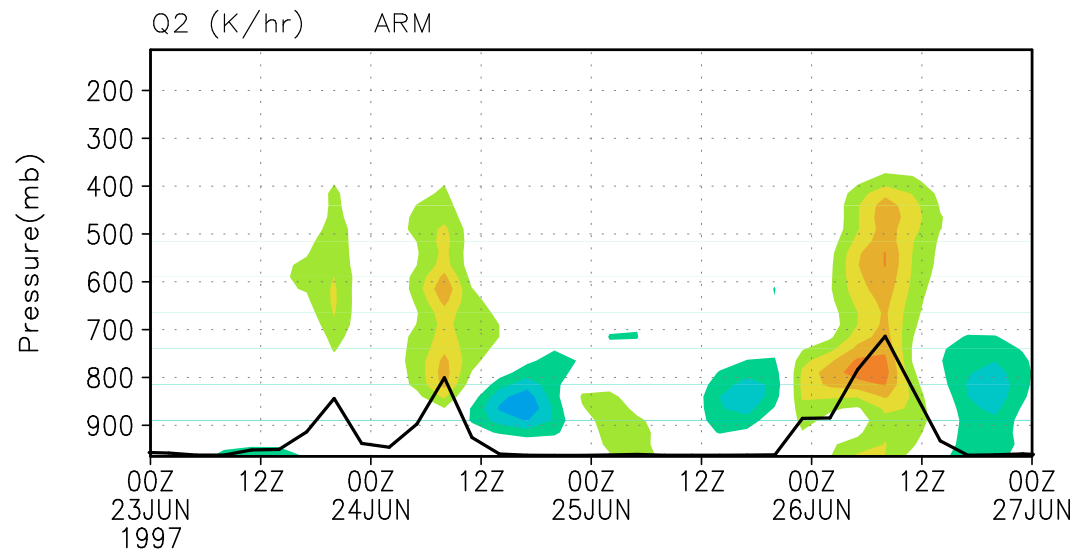












## Summary

- 1.State variables (u,v, T, q) are well captured by the CFSR, but the spatial derivative fields are not.**
- 2. Advective tendencies associated with synoptic events are qualitatively consistent with ARM analysis. They may be suitable for ARM variational adjustments.**
- 3.But those associated with convections are very different from ARM data, in both temporal and vertical distributions.**