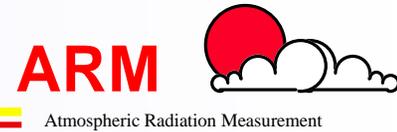


Large-Scale Forcing for ISDAC

Shaocheng Xie
Lawrence Livermore National Laboratory

Forcing Based on ECMWF Analyses



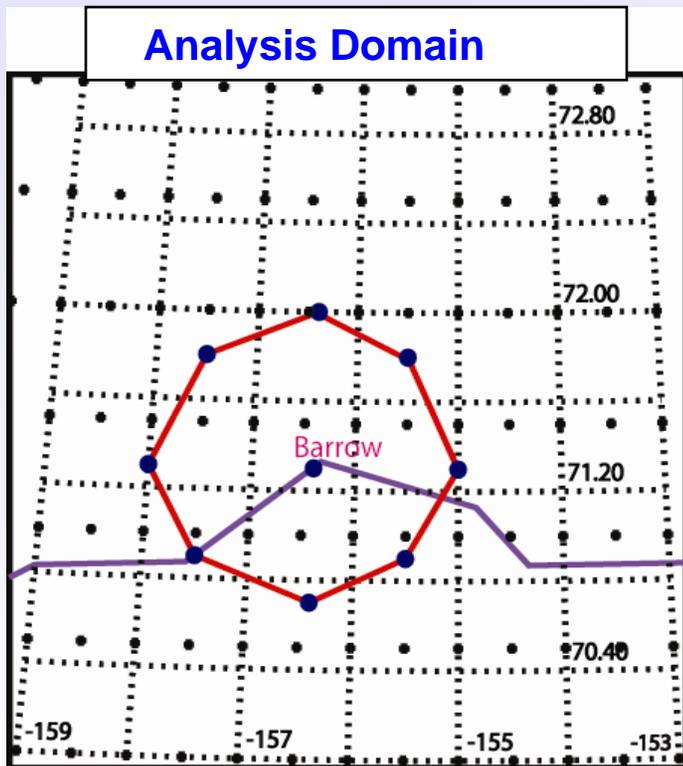
The variational analysis developed by *Zhang and Lin (1997)* was used to derive the forcing fields for ISDAC

Required fields to run the variational analysis

- ✓ U, v, T, q
- ✓ TOA and surface radiative fluxes
- ✓ Surface precipitation
- ✓ SH and LH
- ✓ Other surface meteorology fields

As a starting point, ECMWF analysis and model forecast data are used. Further improvements could be done once surface observations are available.

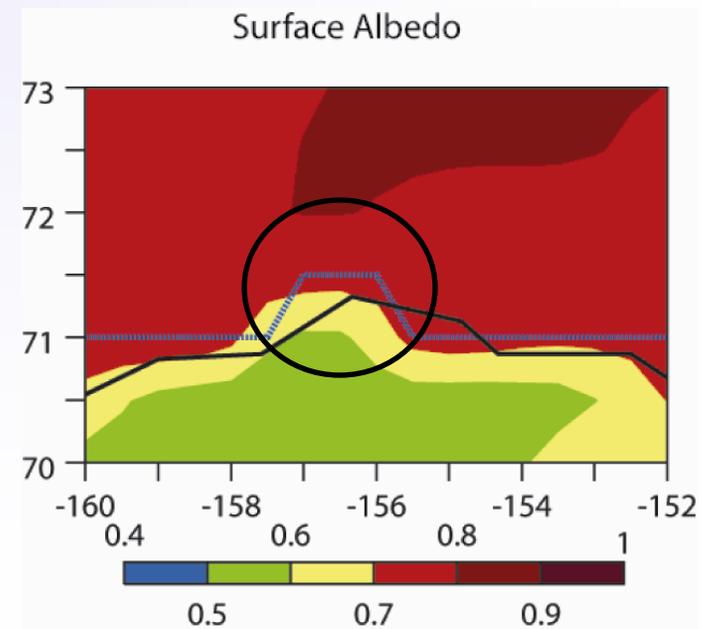
Analysis Domain



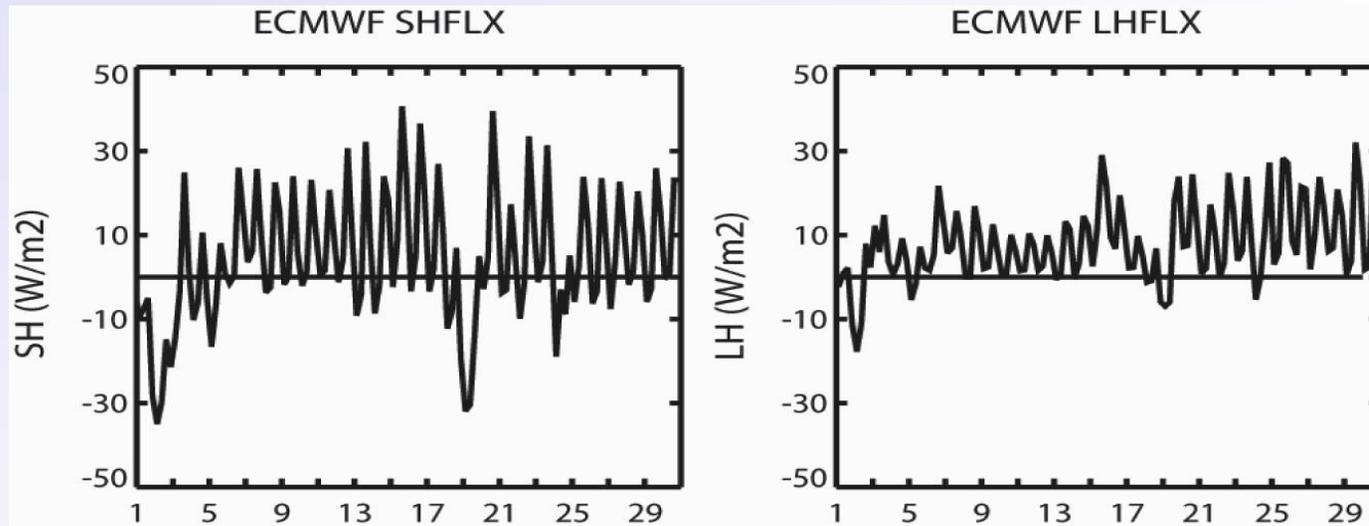
Rationale

- ✓ A pool of open water to the west of Barrow, significant source of water
- ✓ Enhanced measurements near Barrow

Unfortunately, ECMWF can't see the pool



Surface Heat Fluxes

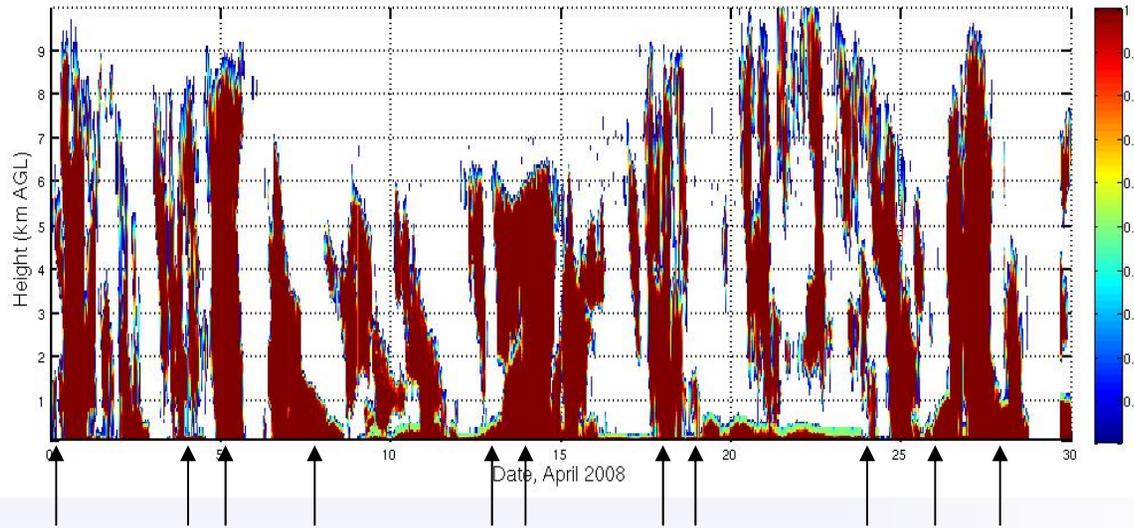


Weak surface fluxes

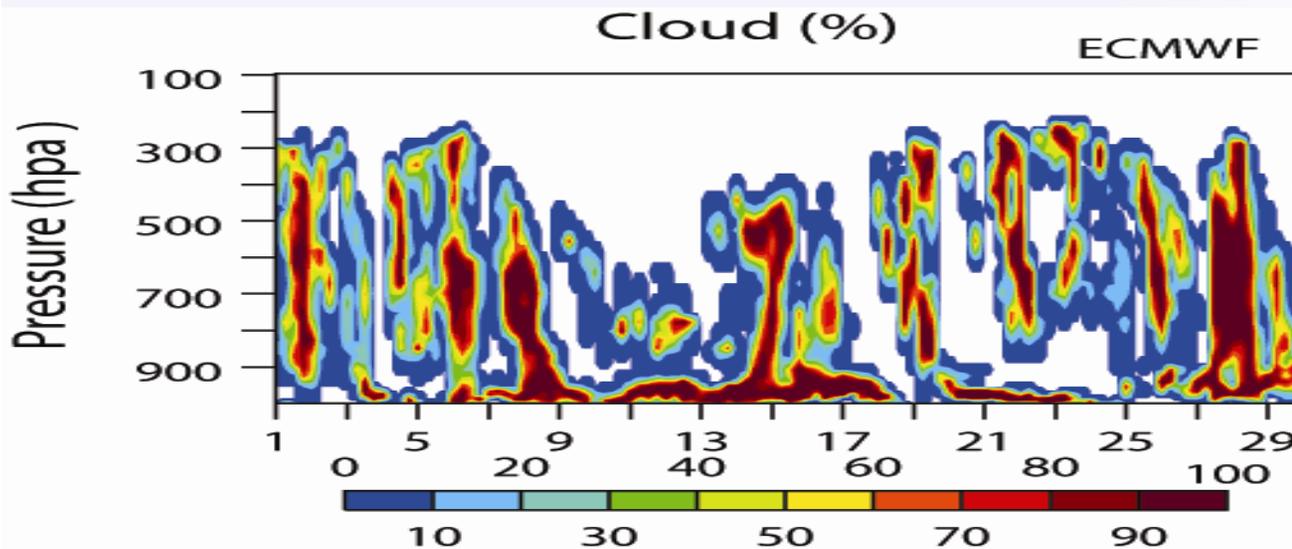
Simulated clouds vs. OBS



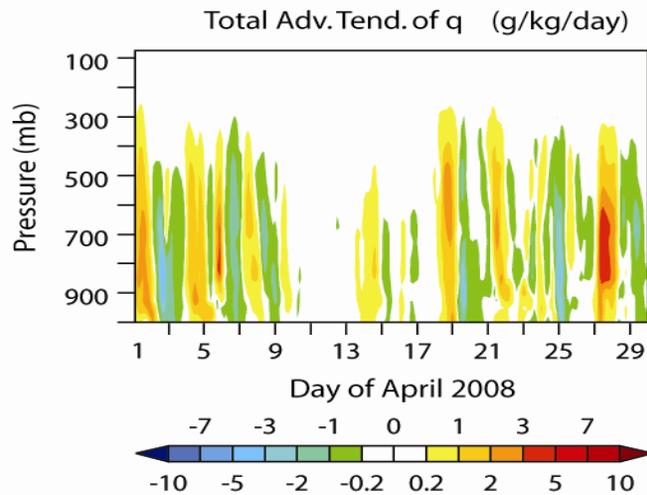
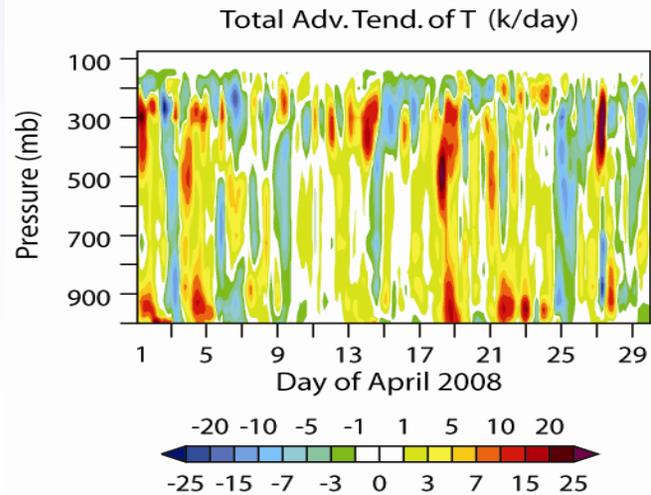
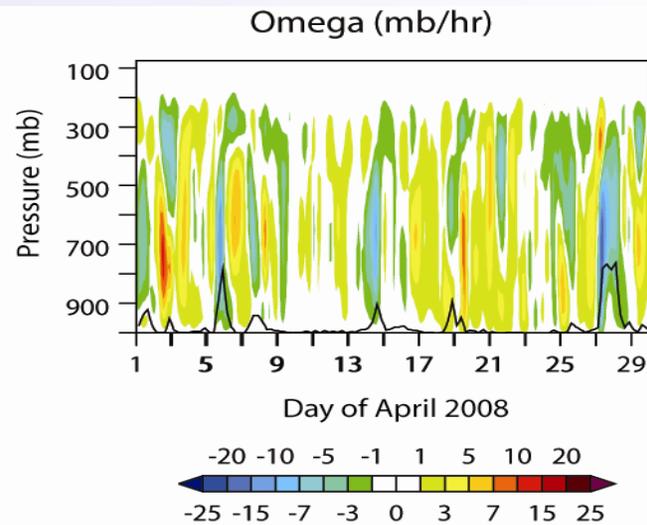
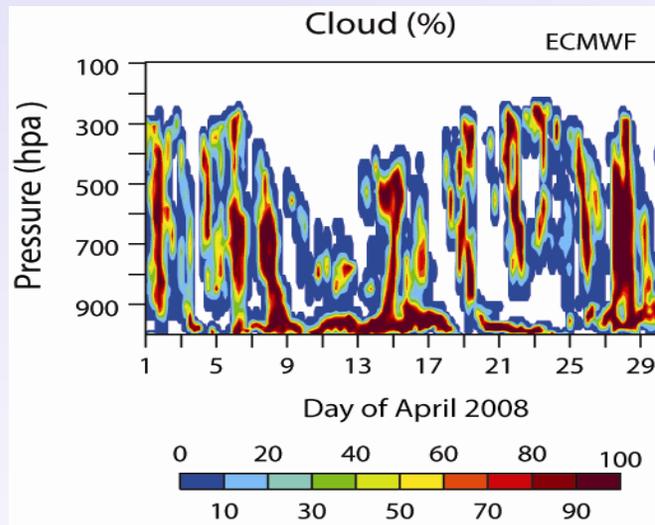
Atmospheric Radiation Measurement



Verlinde and Bahrman
(2008)



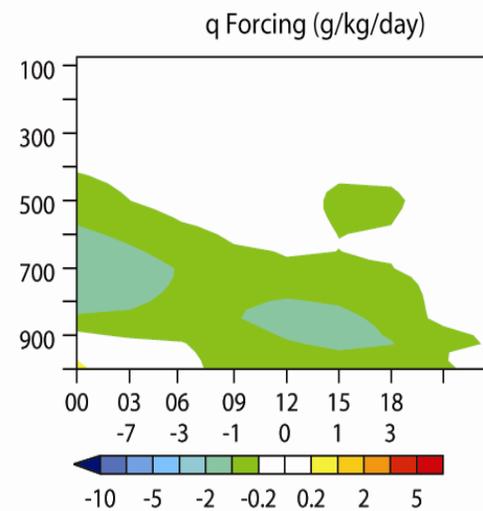
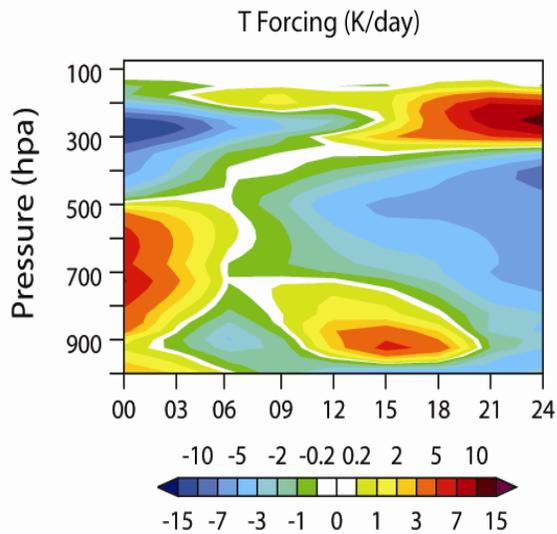
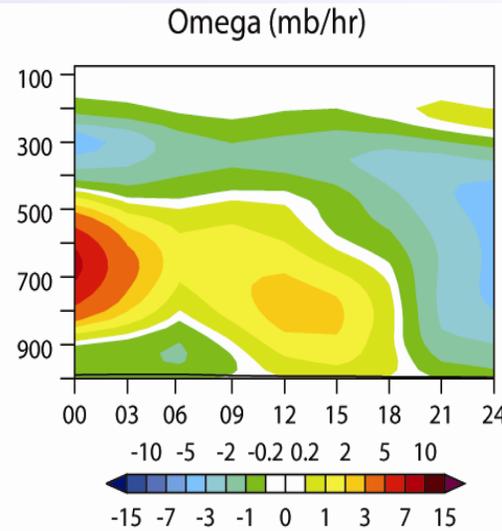
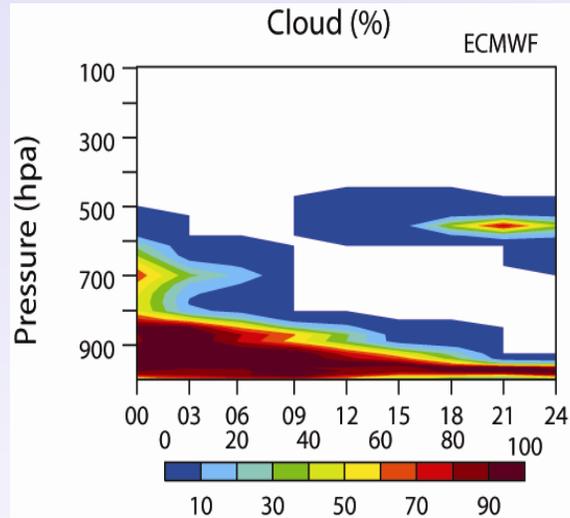
Large-scale forcing fields



Golden day 4/8

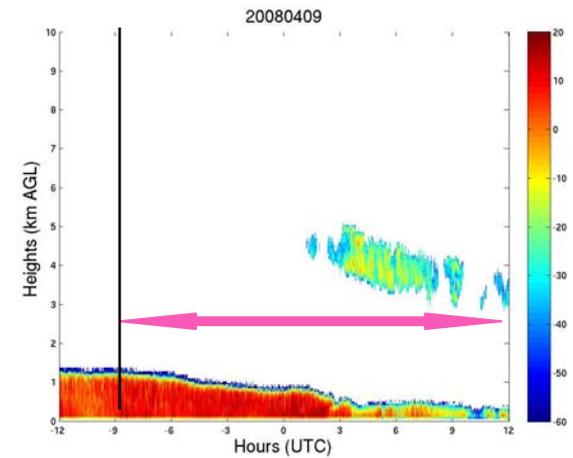


Atmospheric Radiation Measurement



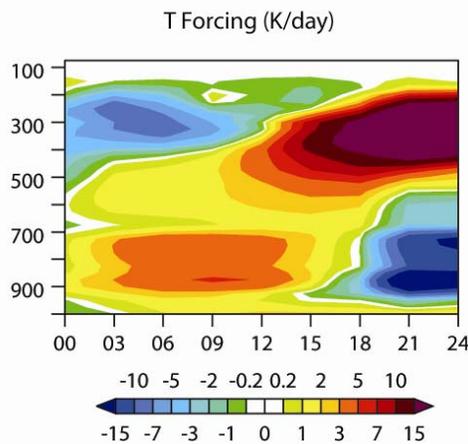
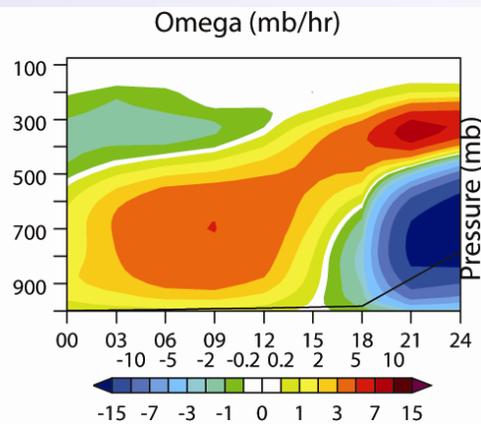
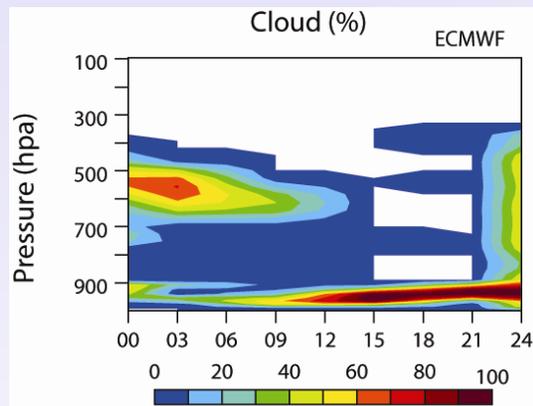
Hours (LST)

Hours (LST)

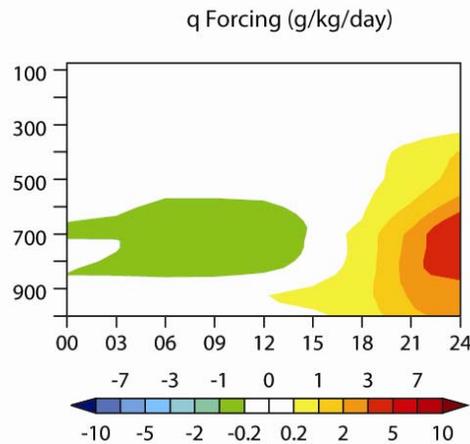


Verlinde and Bahrman
(2008)

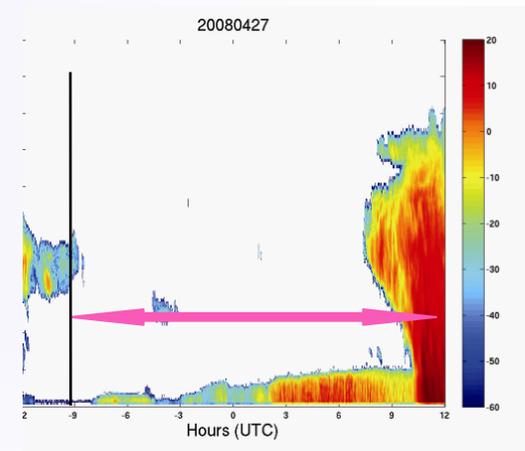
Golden day 4/26



Hours (LST)



Hours (LST)

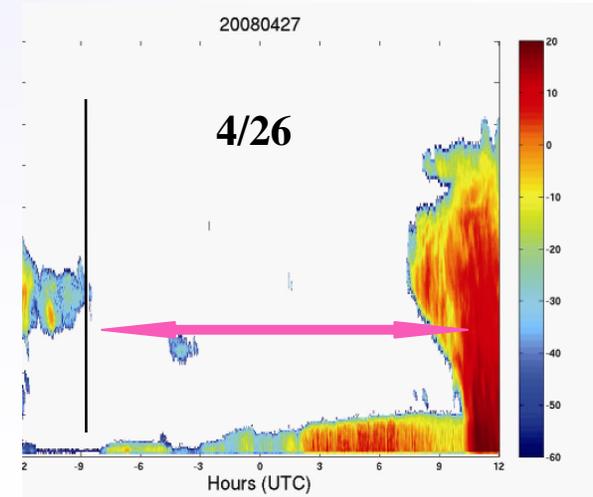
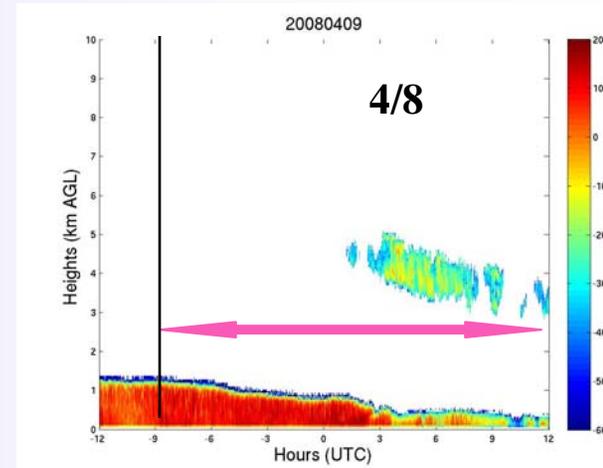
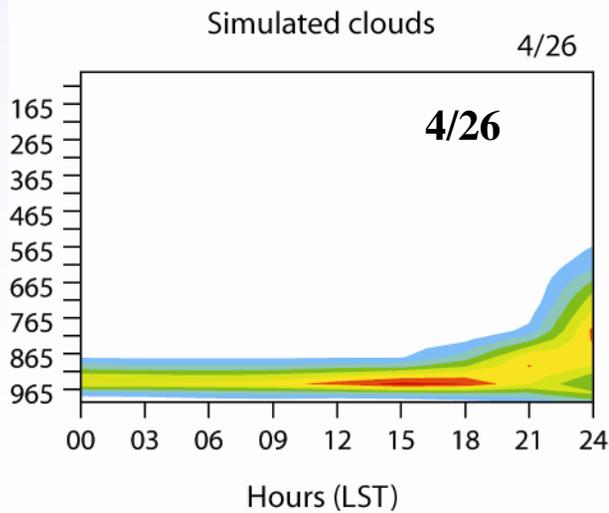
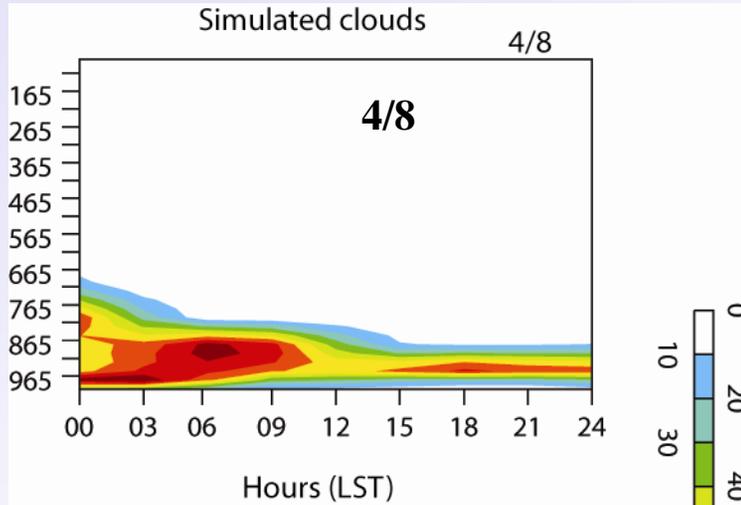


**Verlinde and Bahrman
(2008)**

SCAM simulations

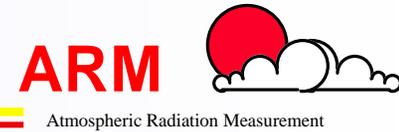


Atmospheric Radiation Measurement



Verlinde and Bahrman
(2008)

Possible improvements



- **Observed surface constraints**
- **Compute SH and LH from observations by assuming a water surface**