Initial stages of longwave ICRCCM3: ICRCCM for longwave 3D

Robert G. Ellingson, Jiujing Gu, and Ezra E. Takara
Dept. of Meteorology
Florida State University
Tallahassee, FL 32306

ARM IRF
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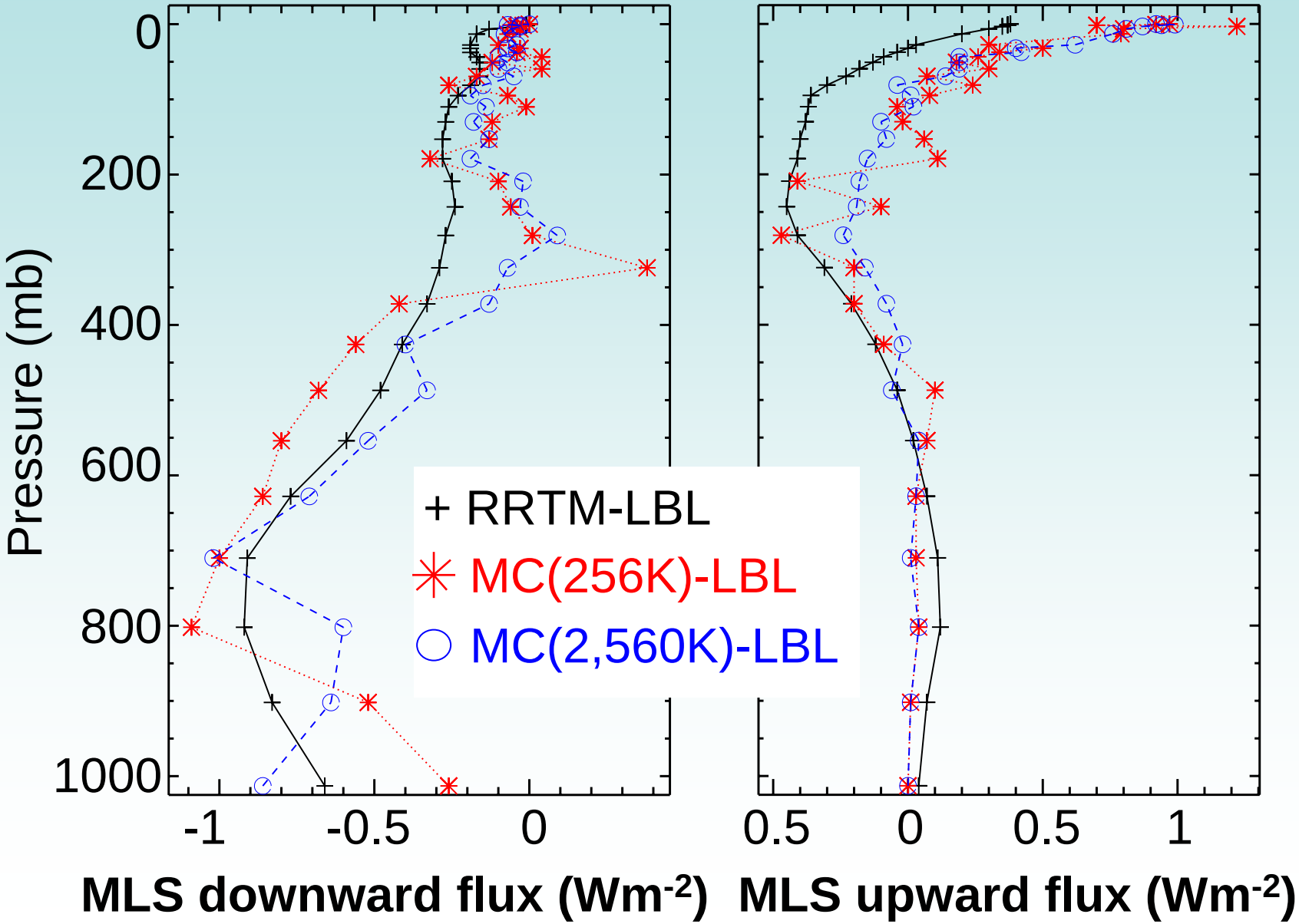
Motivation for longwave ICRCCM3

- 1991 Ellingson et. al. shortwave and longwave ICRCCM1, primarily 1D.
- 2000 Barker et. al. shortwave ICRCCM3, featuring realistic 3D cloudiness conditions in for nine cloud cases. (http://reef.atmos.colostate.edu/icrccm)
- Extend ICRCCM3 into the longwave – 3D and scattering.

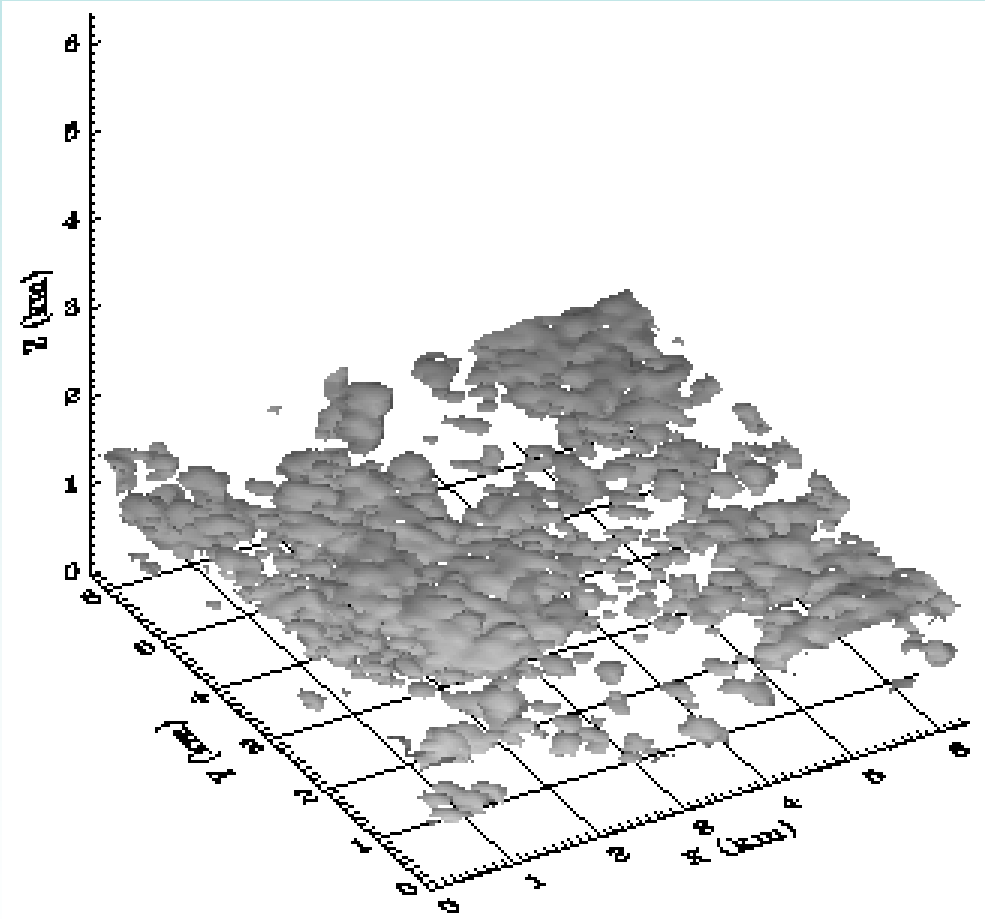
Methodology and initial results

- Following Barker, combine an MC code with a correlated-k distribution.
  - MC code: backward MC with uniform cells.
  - The k’s from RRTM_LW
- Clear sky validation of MC code with LBLRTM version 9.4
- A few results for the simpler ICRCCM3 cases

RRTM, Monte Carlo compared to LBL

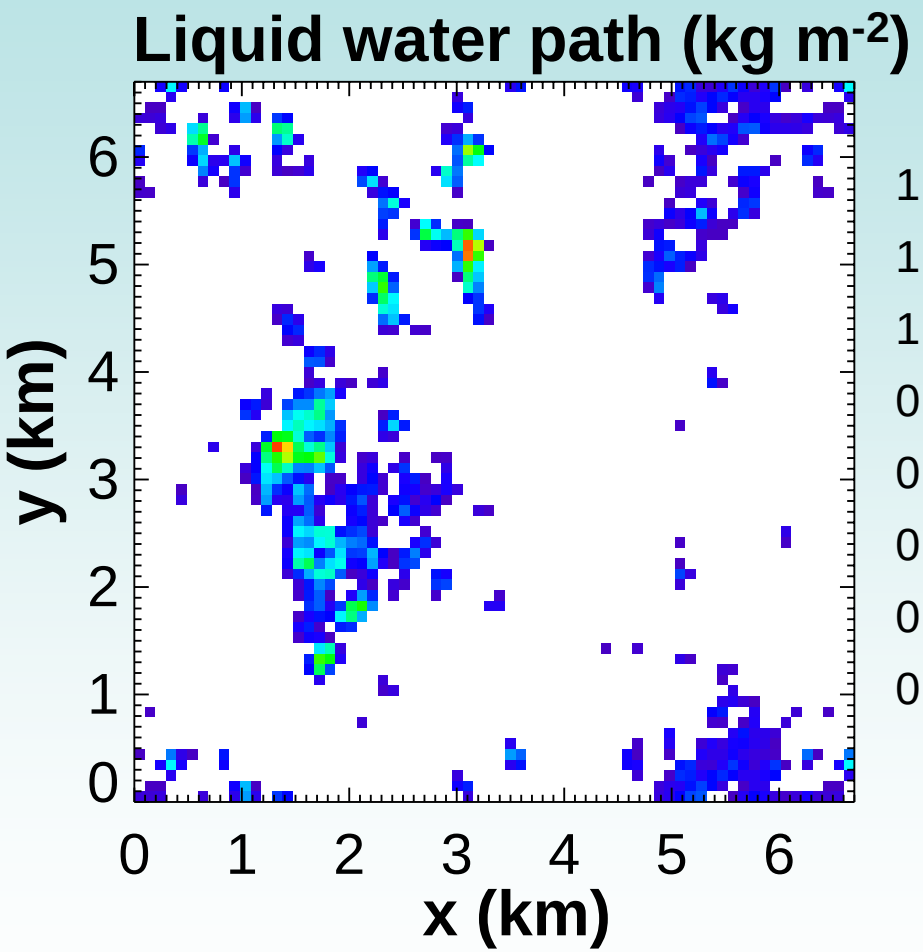


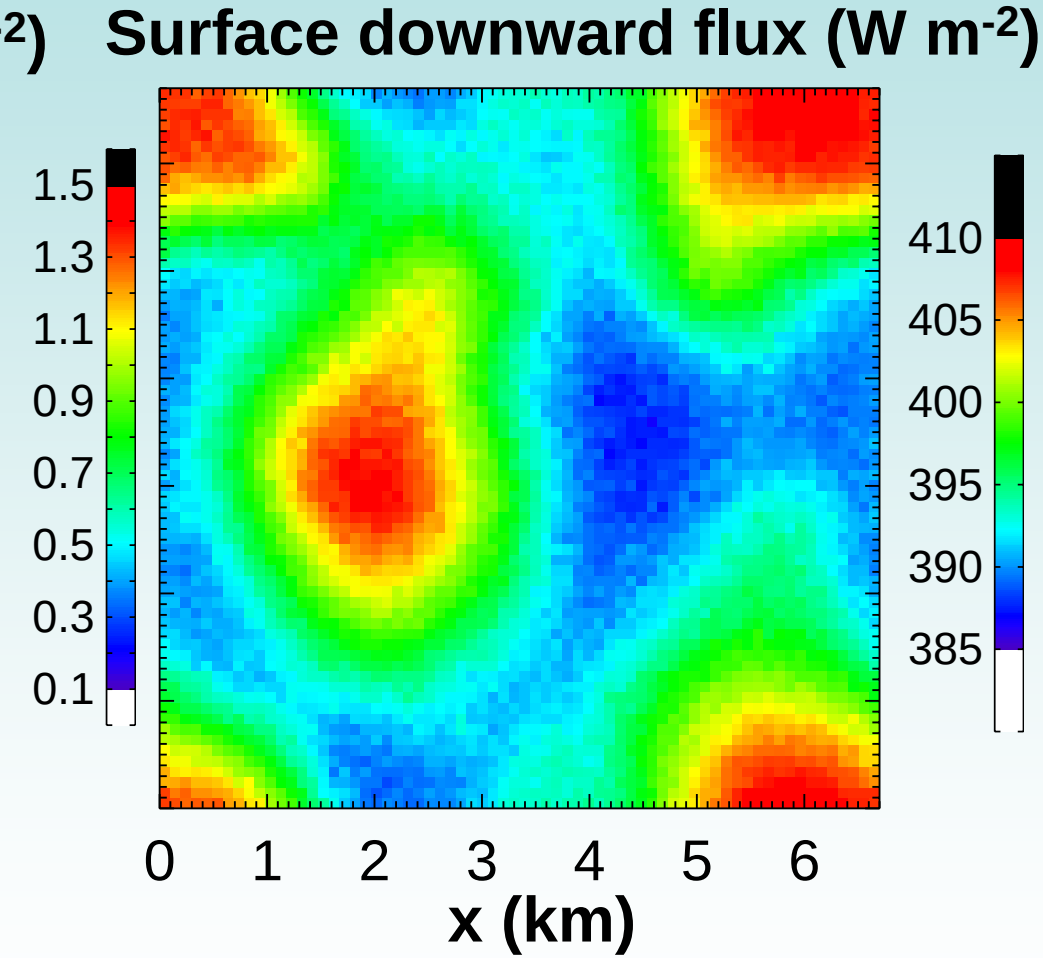
ATEX - broken stratocumulus



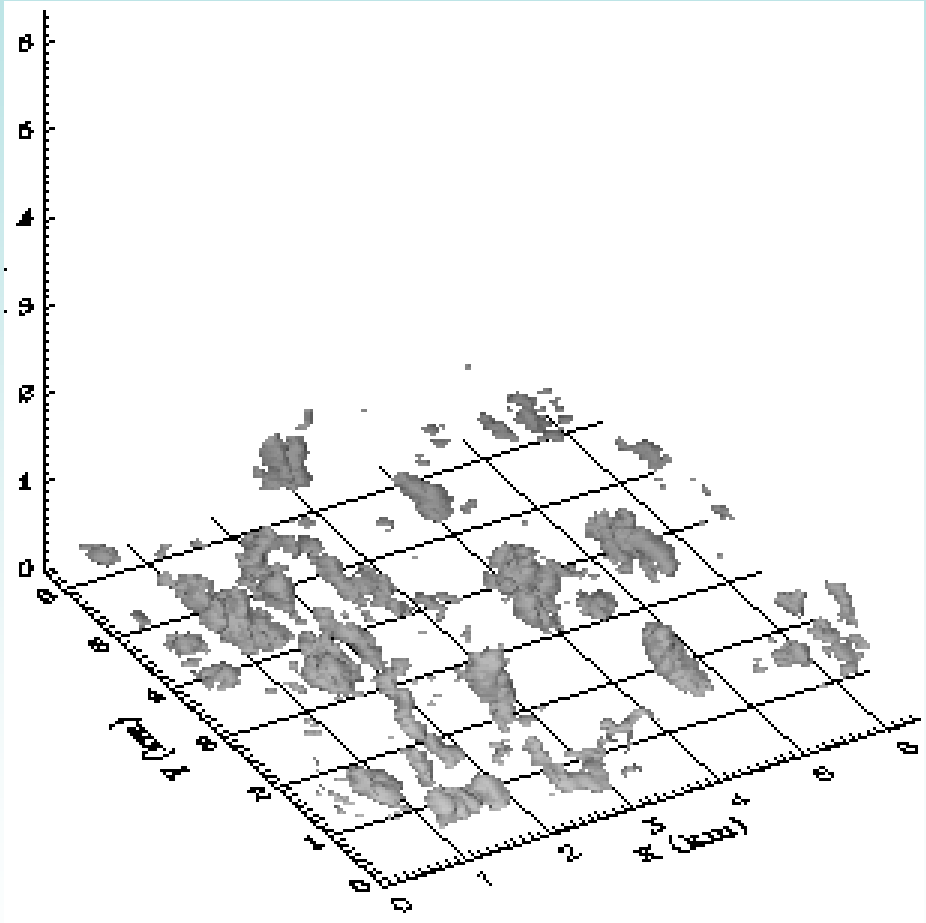
http://reef.atmos.colostate.edu/icrccm/cases.html

ATEX 6.8km X 6.8km – 100m



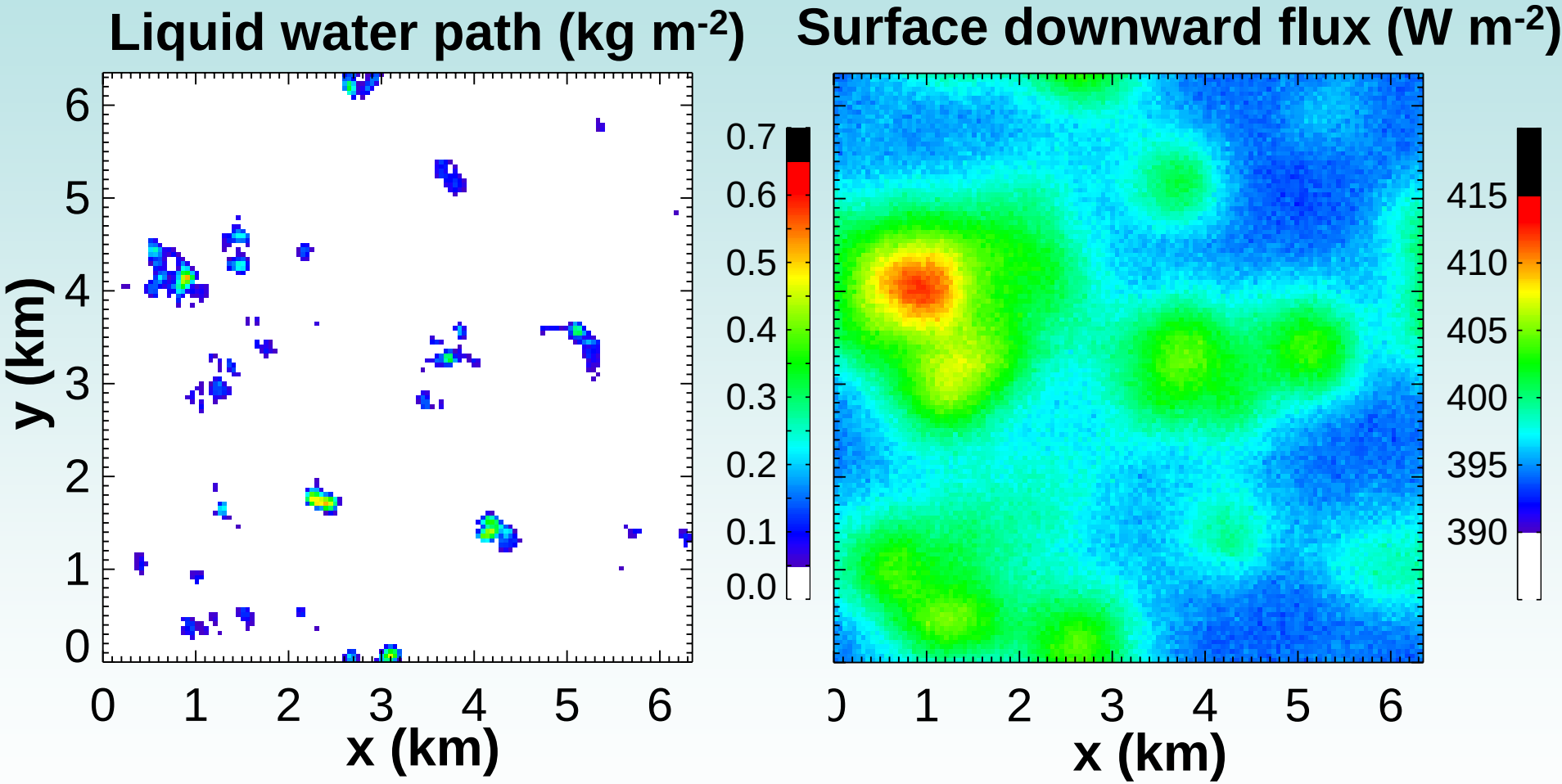


BOMEX - shallow, sparse cumulus

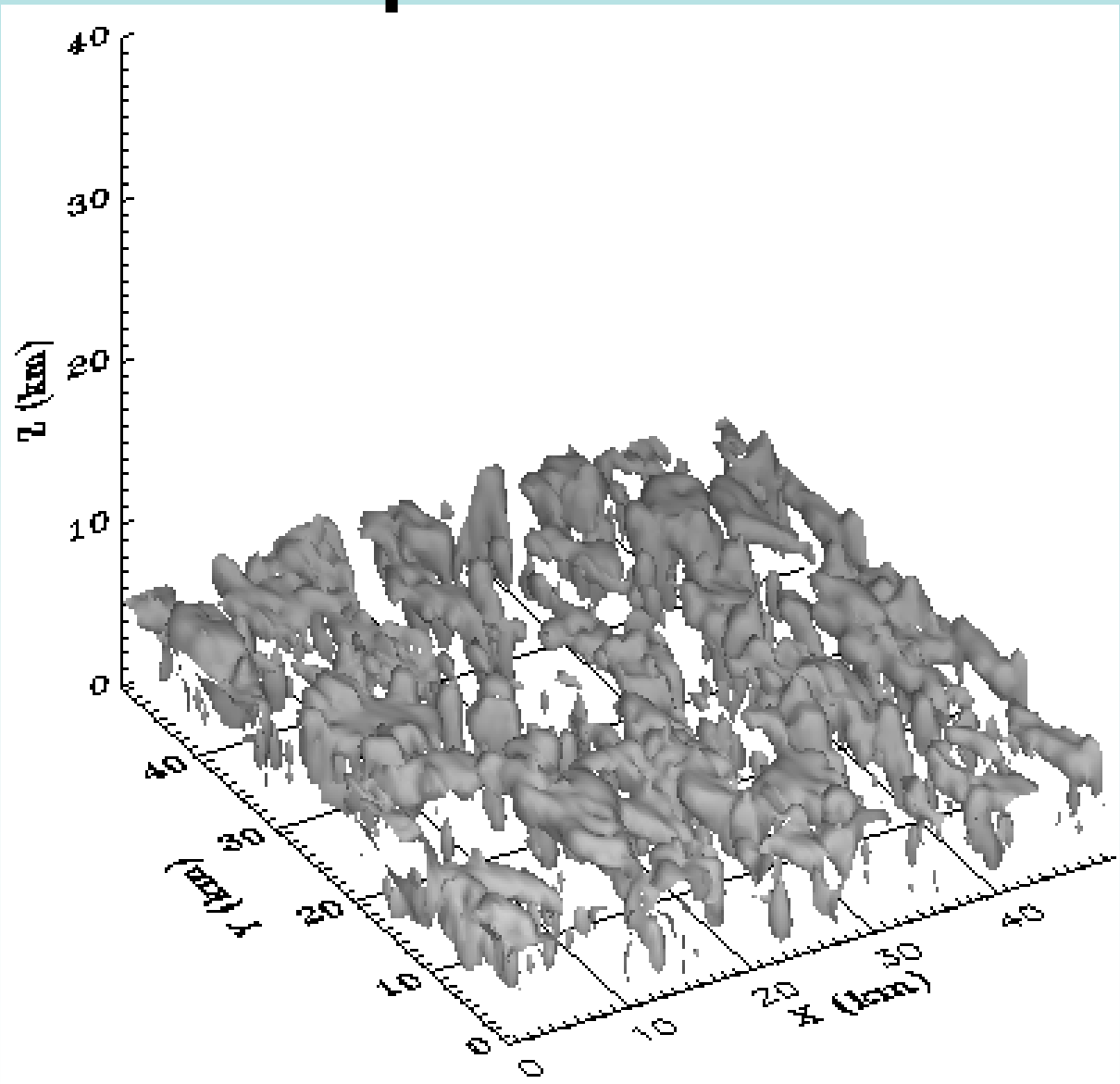


http://reef.atmos.colostate.edu/icrccm/cases.html

BOMEX 6.4km X 6.4km – 50m

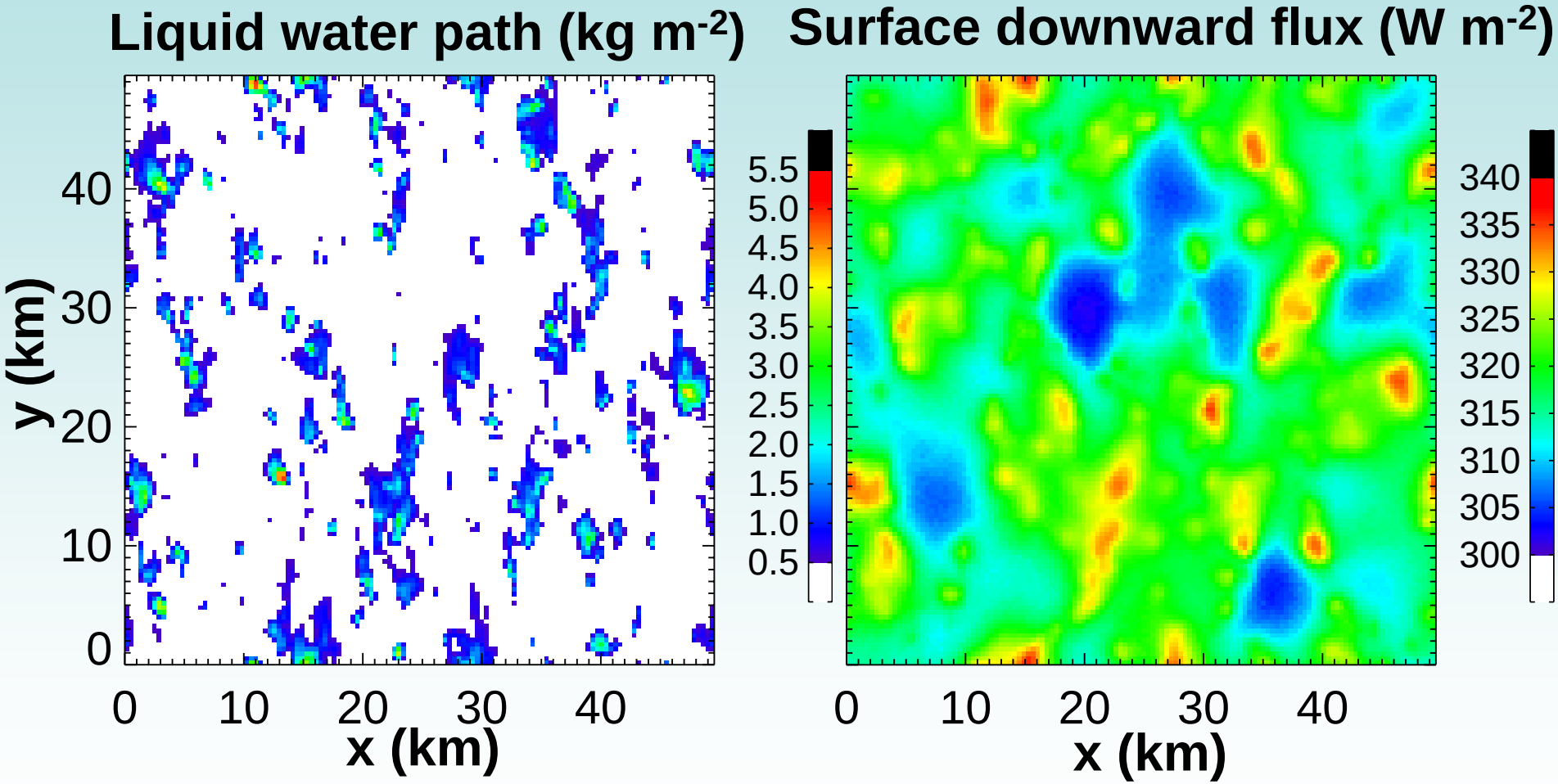


Open Cells - open cellular convection



http://reef.atmos.colostate.edu/icrccm/cases.html

Open Cells 49.9km X 49.9km – 390m



We invite your participation and suggestions