

Input data

- MODIS C6: 2D joint histogram of cloud optical thickness (COT) and top pressure (CTP)
 - 6-level COT by 7-level CTP: total 42 bins of cloud fraction (CF)
 - 1°×1° horizontal resolution
 - Tropics (15°S-15°N) Only: 360×30 grid points
 - 2 times per day (Terra and Aqua)
 - 2002.12.01 to 2015.11.30: 13 years or 4748 days
 - 4-Byte float (real)
- Data size
 - $42 \times 360 \times 30 \times 2 \times 4748 \times 4 = 17.229542400$ GByte
 - Excluding missings and completely cloud-free condition
 - Final size = 14.938271040 Gbyte
 - Final dimension = [42×88,918,280]

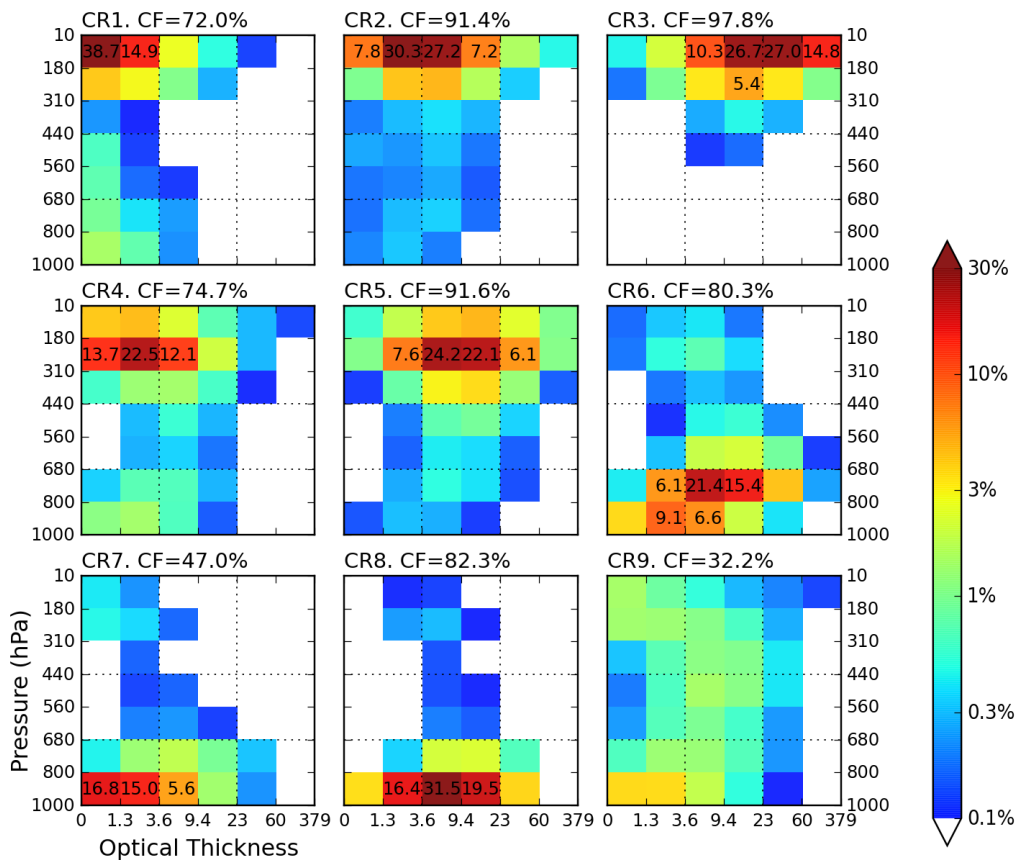
Criteria for selecting final candidate

- Deciding optimal # of clusters, a.k.a K
 - Major: Centroid pattern and its associated “Relative Frequency of Occurrence (RFO)” map
 - Larger K , but no duplication
 - Minor: Repeatability (or Stability of convergence)
 - Same destination with different initial condition
- Finalizing candidate
 - Major1: Smaller “Within Cluster Variation (WCV)”
 - Major2: Repeatability

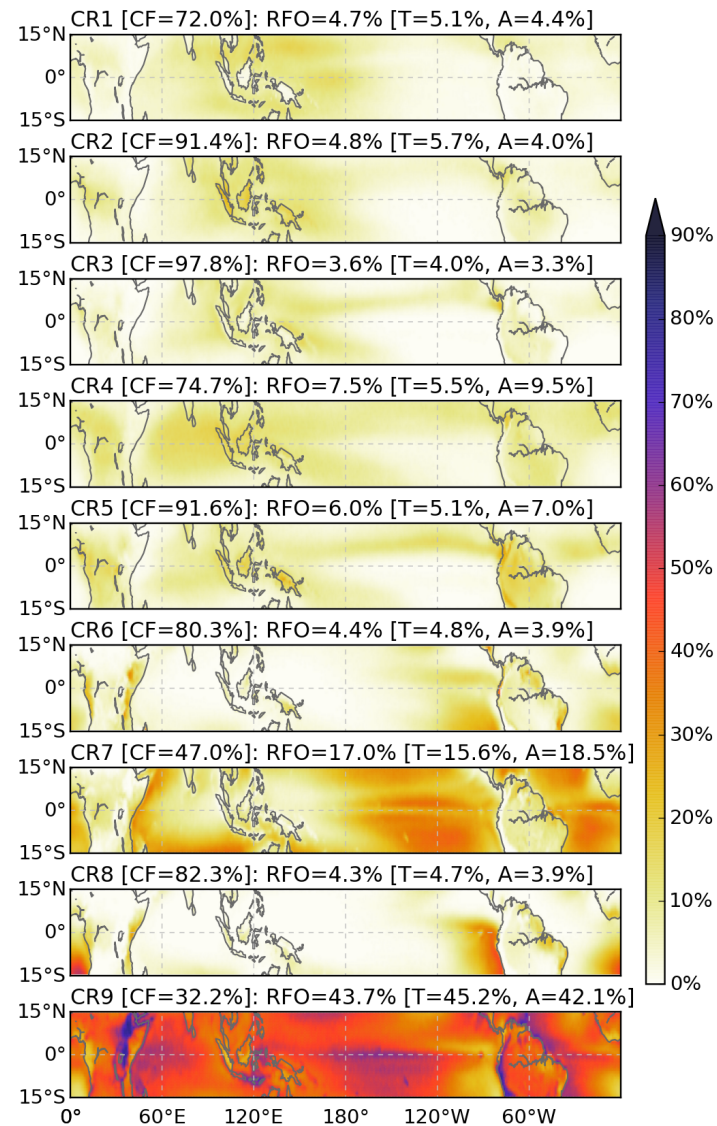
See Excel File

A candidate: K=9, id=2

MODIS T+A Tropical CRs, K=9, id=2

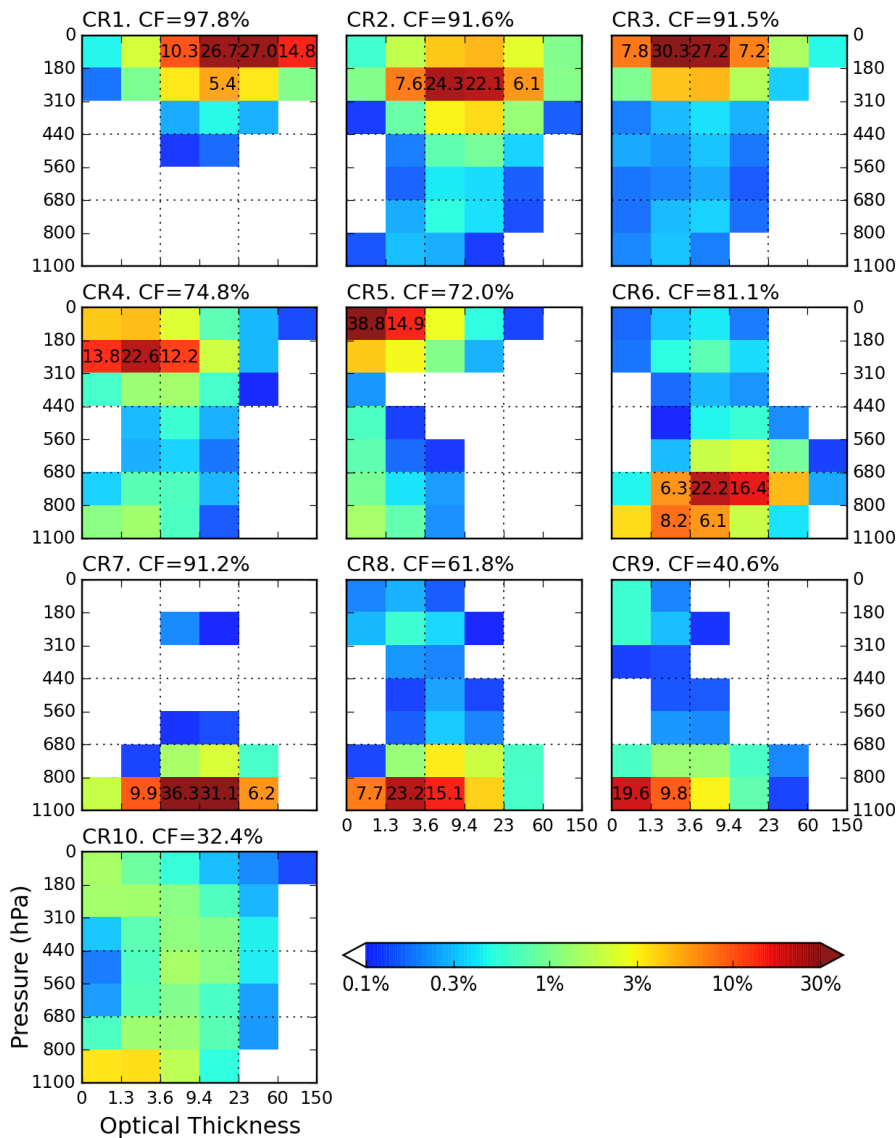


MODIS T+A Tropical CR RFO, K=9, id=2

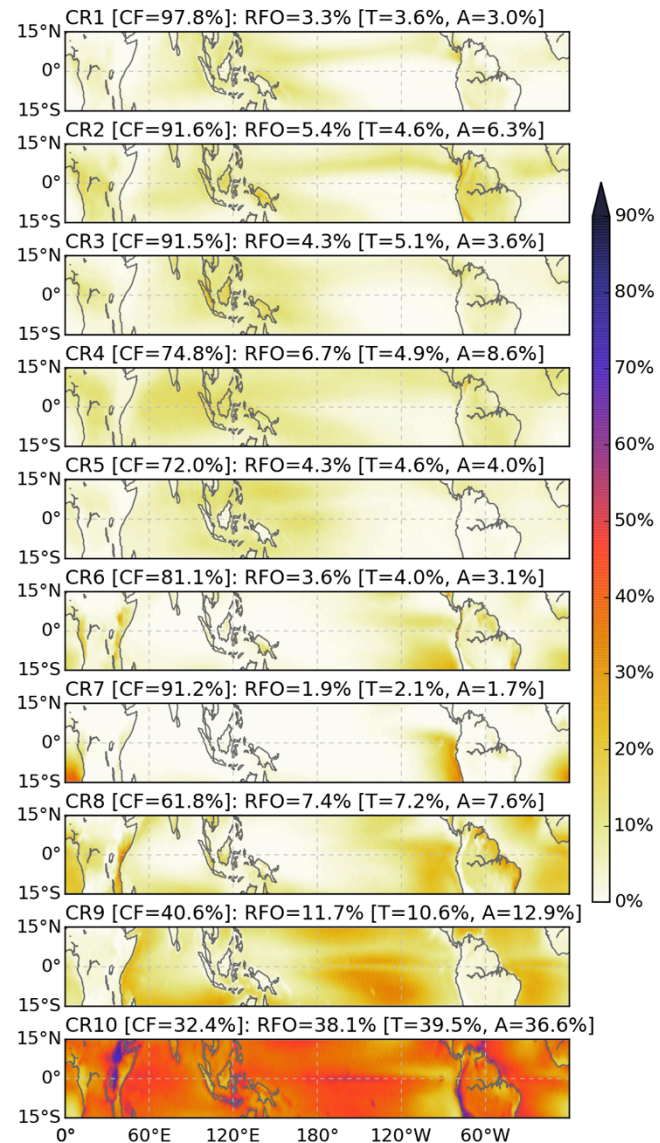


Final Centroid: K=10, id=24

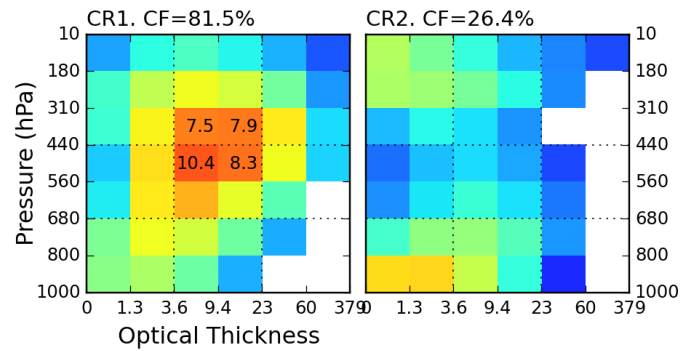
MODIS C6 Terra+Aqua Tropical CRs



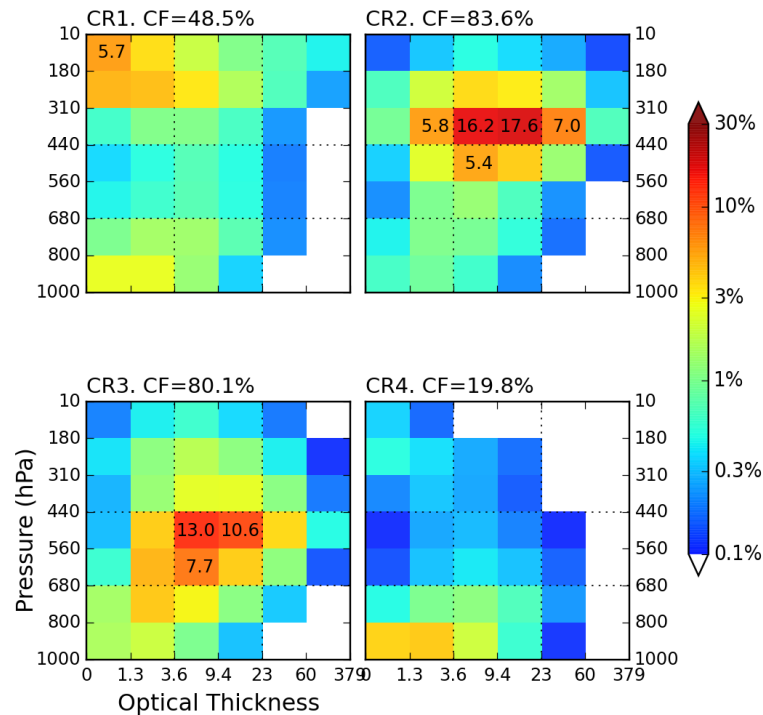
MODIS C6 Terra+Aqua Tropical CR RFOs



MODIS T+A Tropical CRs, K=10, id=24, SubCR2_id15

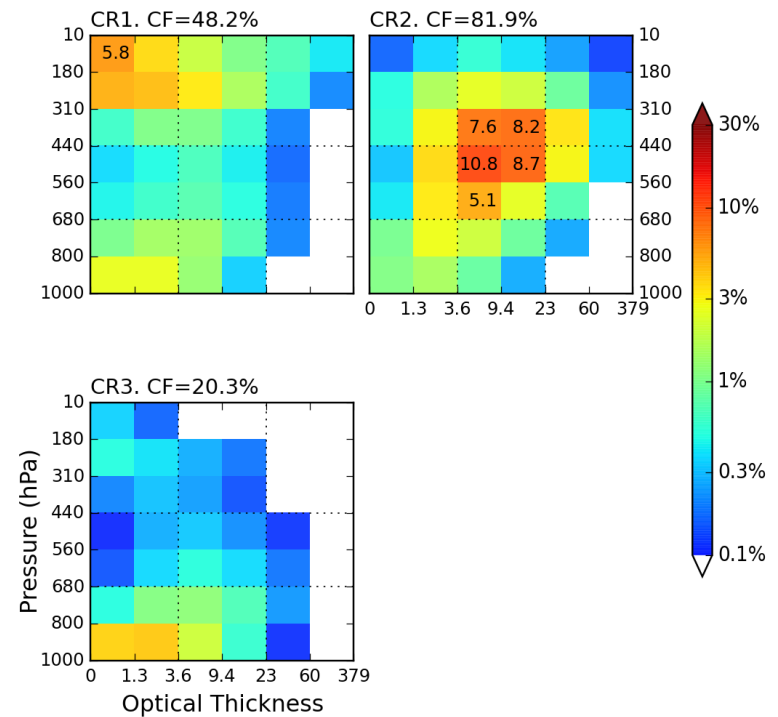


MODIS T+A Tropical CRs, K=10, id=24, SubCR4_id24



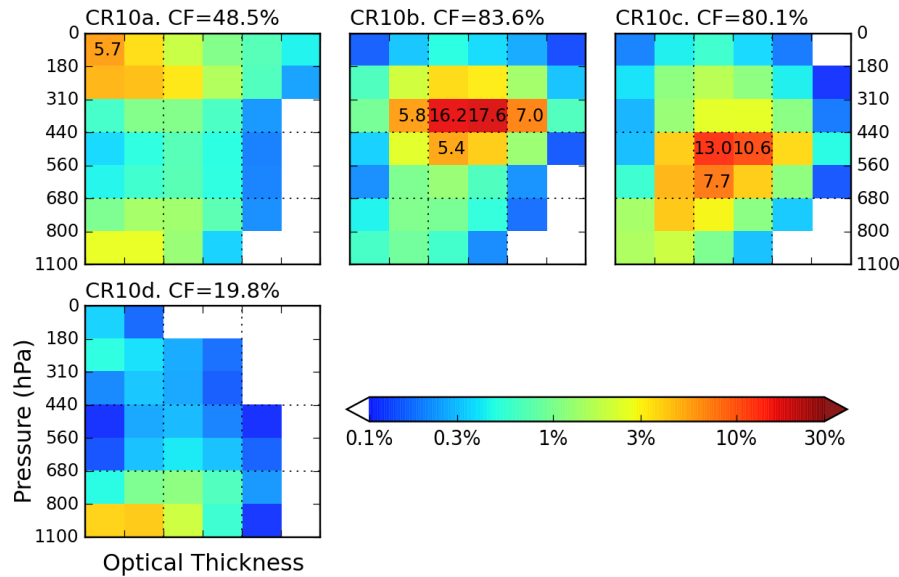
Sub-CRs of CR10

MODIS T+A Tropical CRs, K=10, id=24, SubCR3_id10



Sub-CRs of CR10

MODIS C6 Terra+Aqua Tropical Sub-CRs



MODIS C6 Terra+Aqua Tropical Sub-CR RFOs

