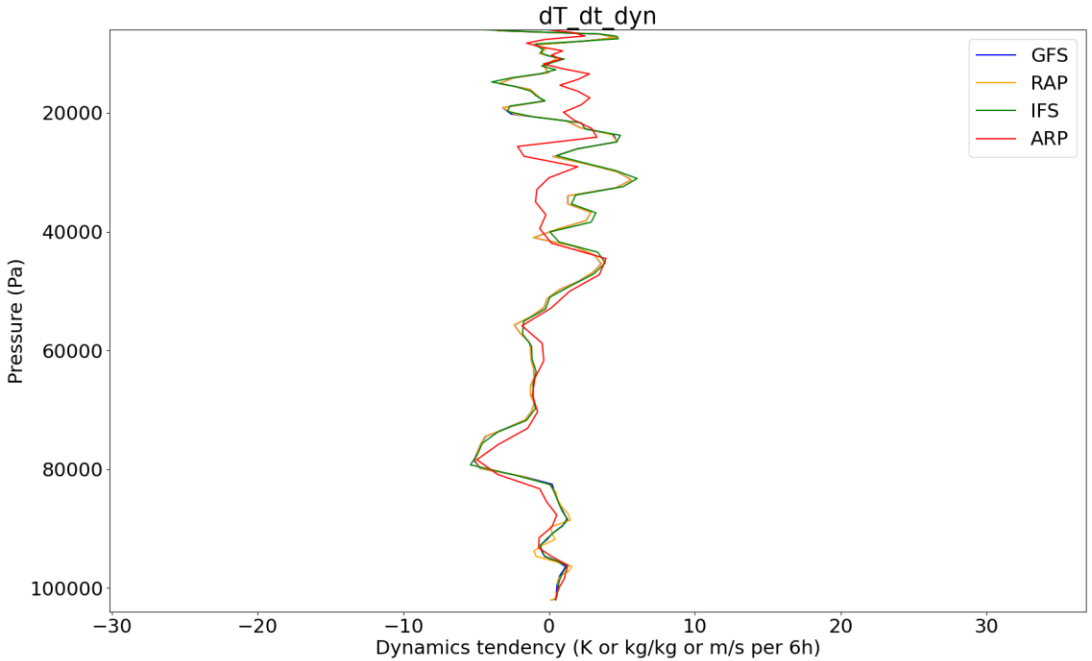
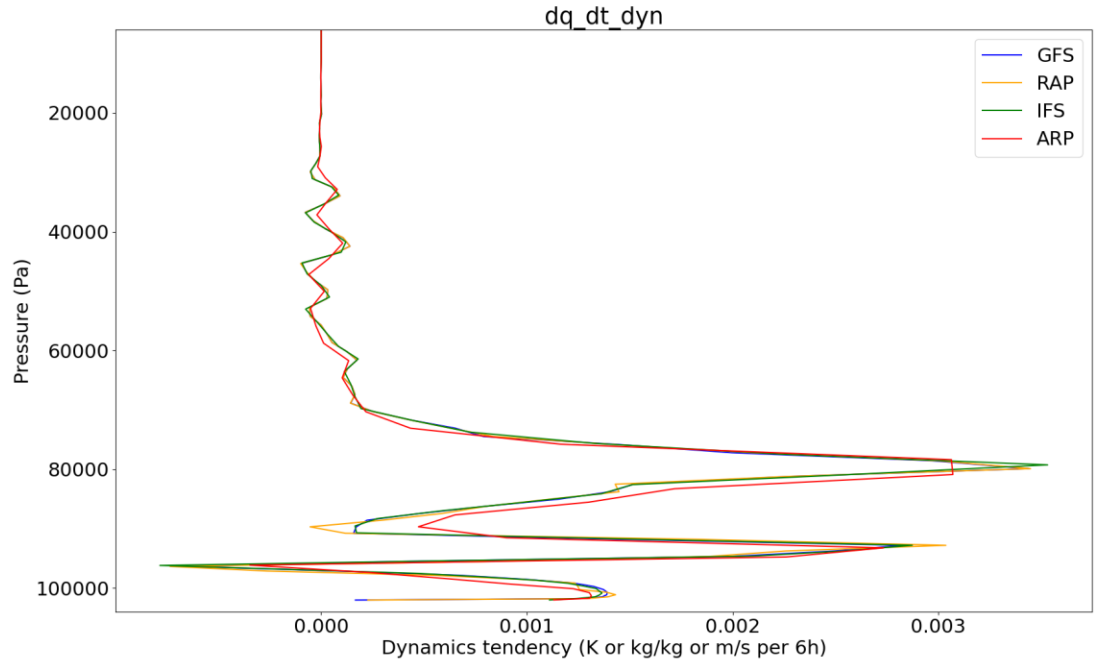
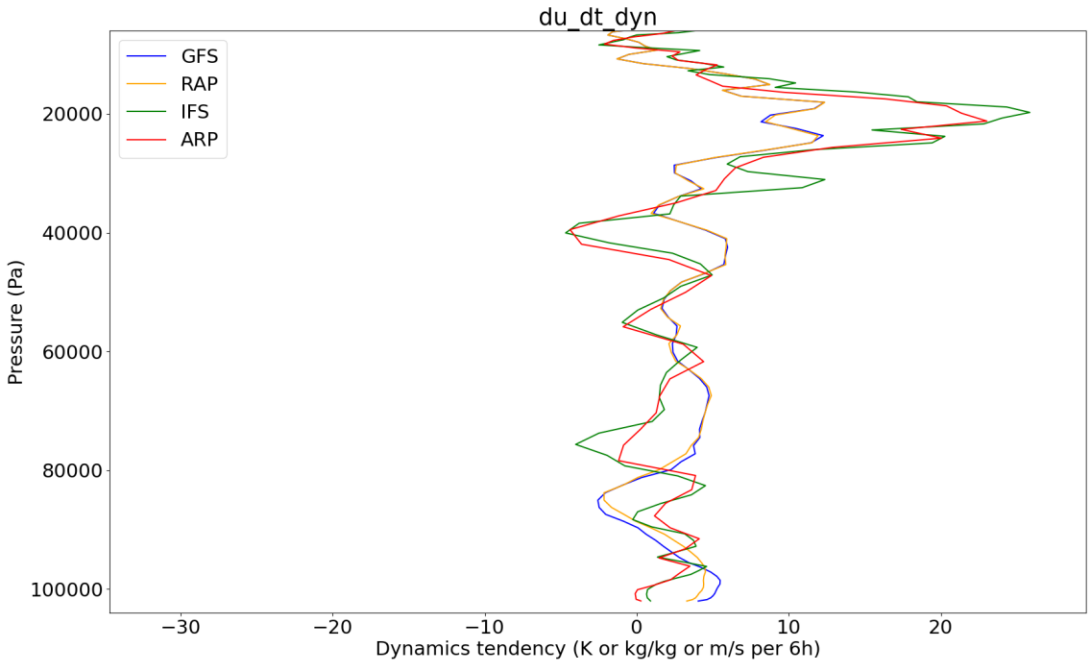
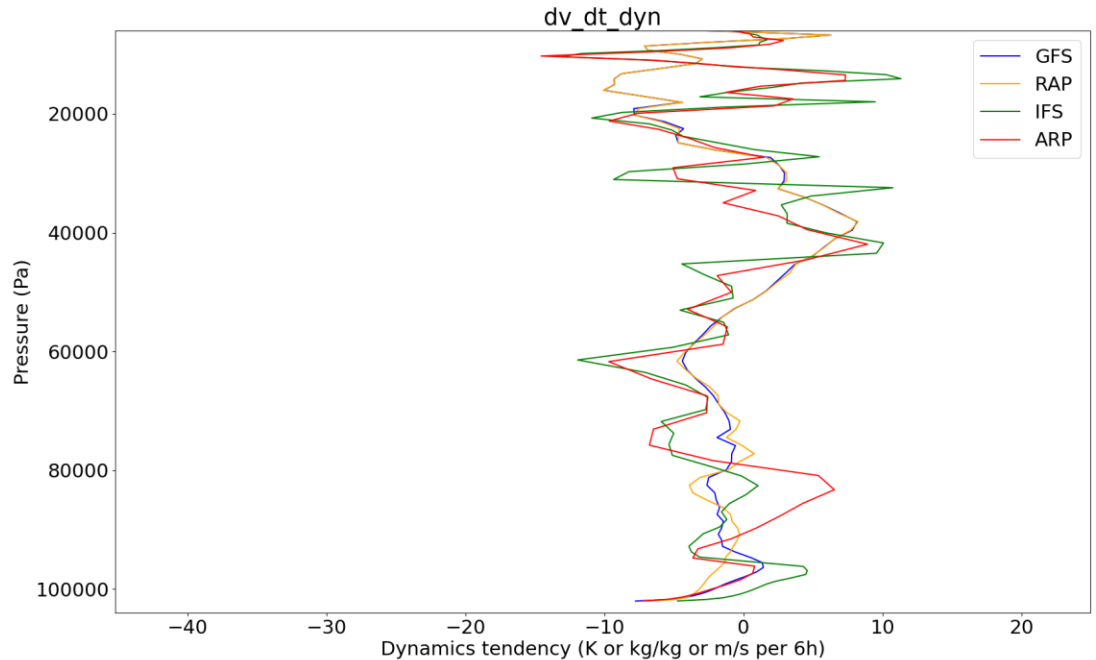
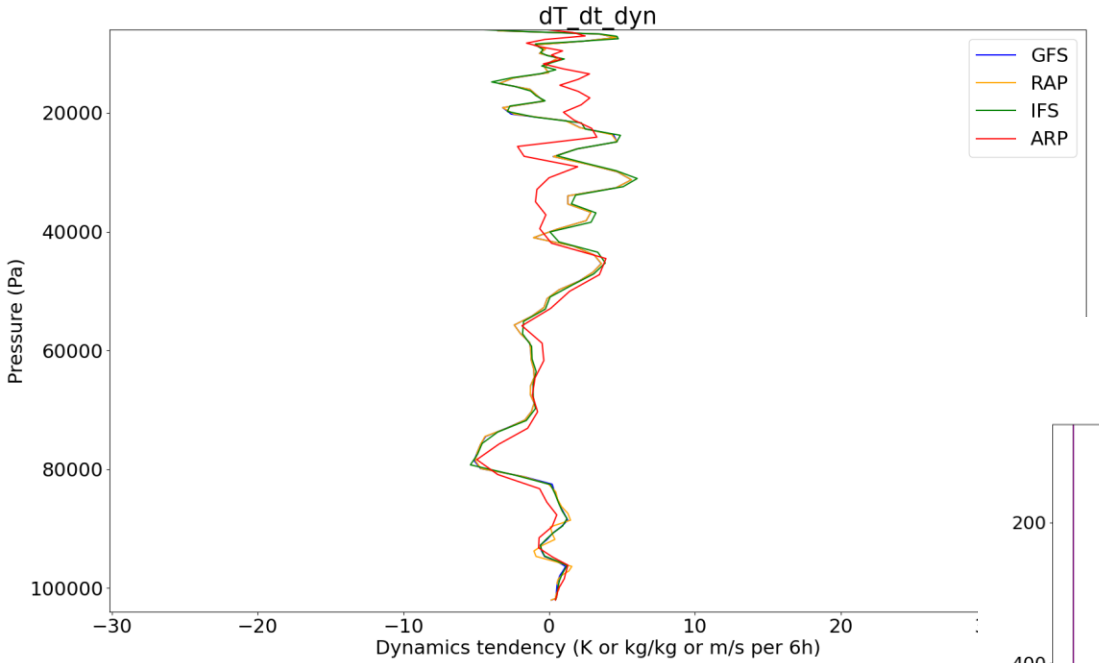
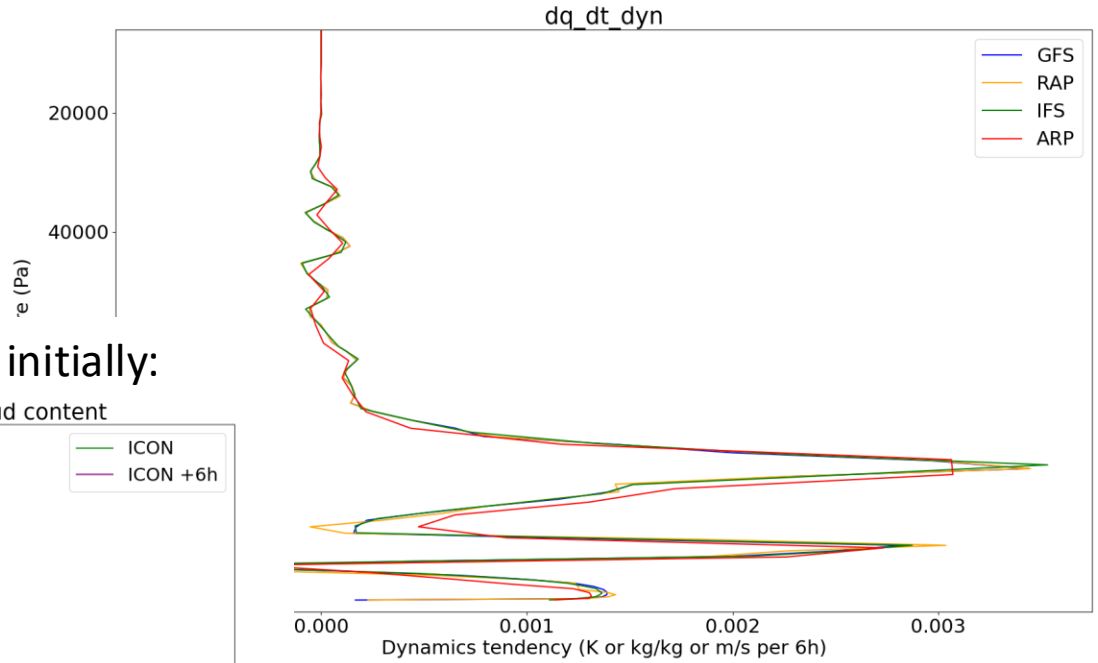

dT_dt_dyn
GFS
RAP
IFS
ARP
Pressure (Pa)
20000
40000
60000
80000
100000
−30
−20
−10
0
10
20
30
Dynamics tendency (K or kg/kg or m/s per 6h)


dq_dt_dyn
GFS
RAP
IFS
ARP
Pressure (Pa)
20000
40000
60000
80000
100000
0.000
0.001
0.002
0.003
Dynamics tendency (K or kg/kg or m/s per 6h)

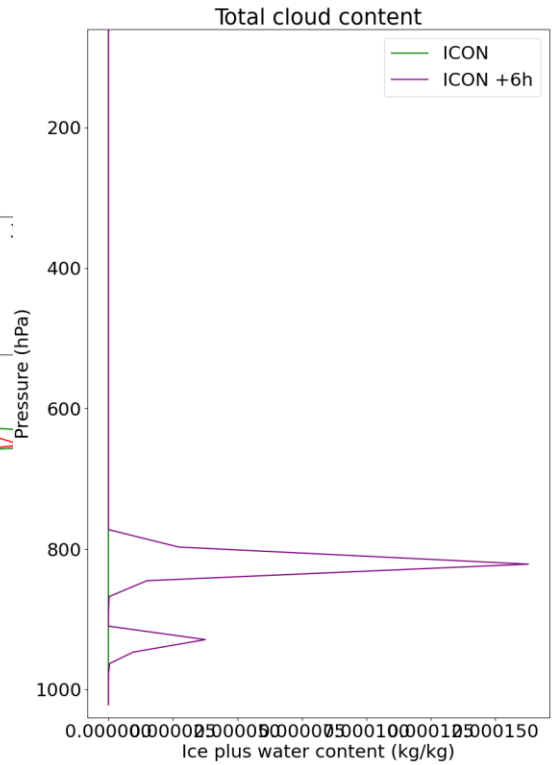

du_dt_dyn
GFS
RAP
IFS
ARP
Pressure (Pa)
20000
40000
60000
80000
100000
−30
−20
−10
0
10
20
Dynamics tendency (K or kg/kg or m/s per 6h)

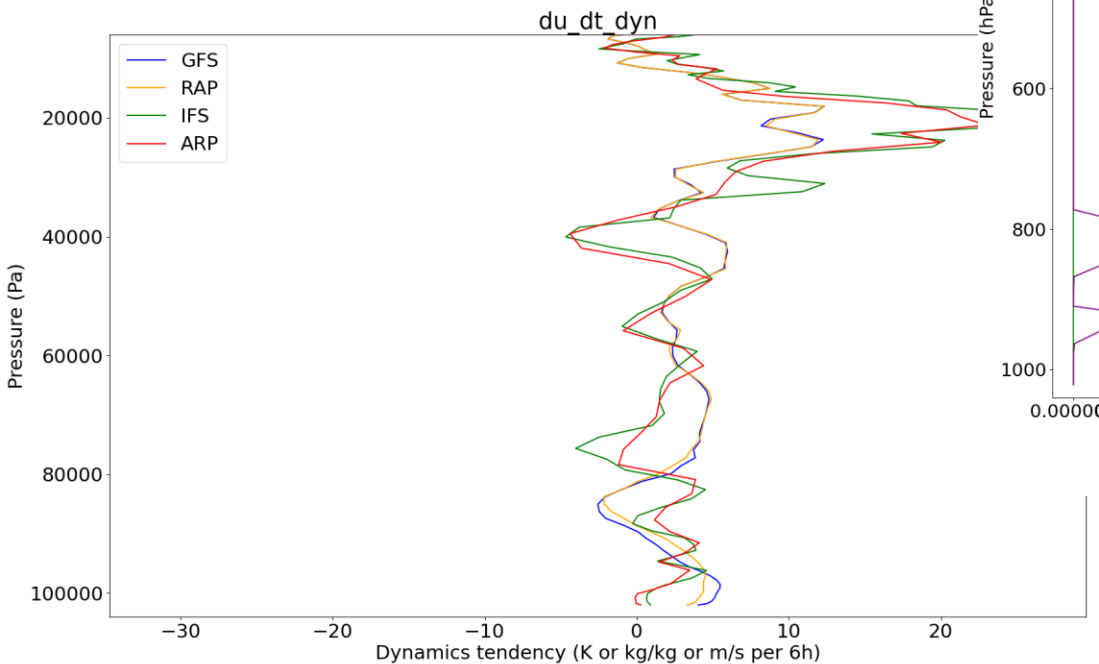

dv_dt_dyn
GFS
RAP
IFS
ARP
Pressure (Pa)
20000
40000
60000
80000
100000
−40
−30
−20
−10
0
10
20
Dynamics tendency (K or kg/kg or m/s per 6h)

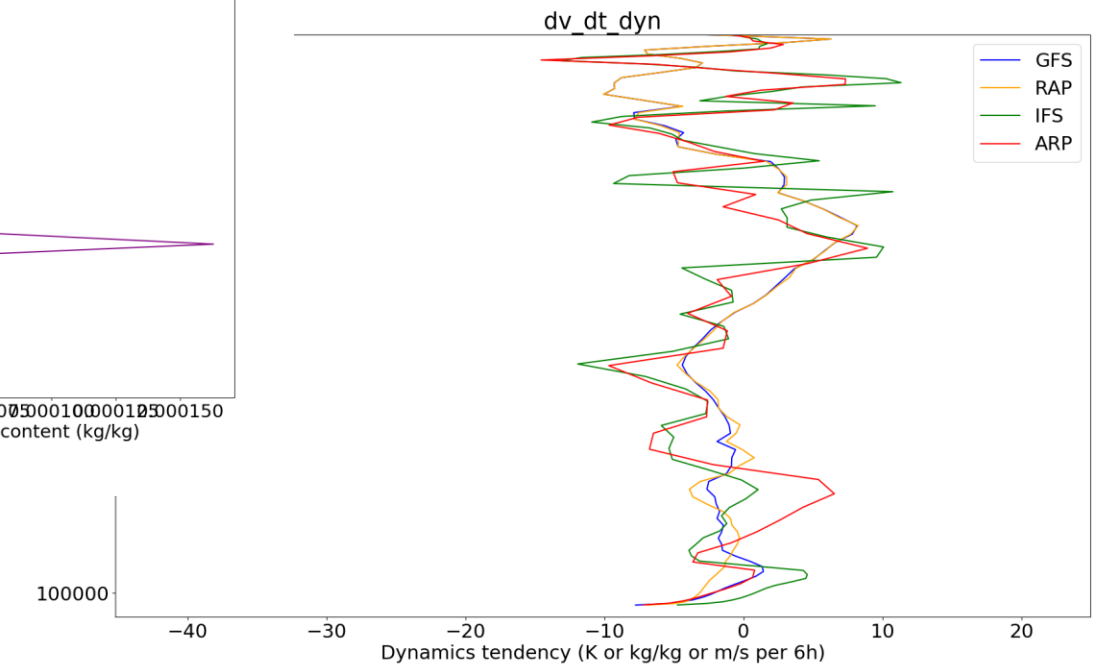


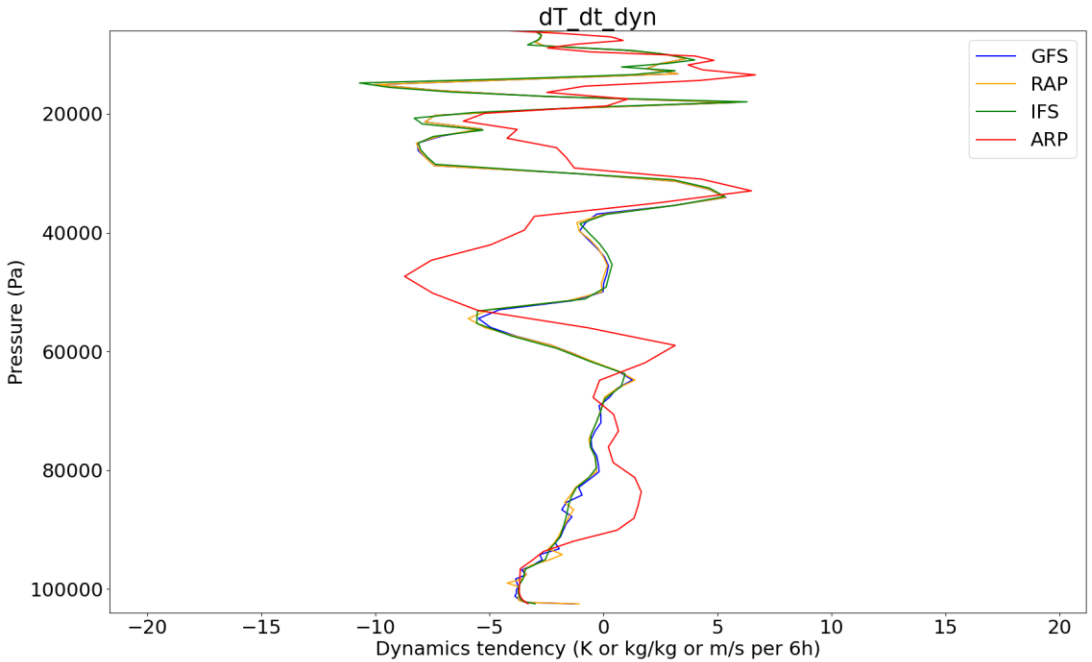


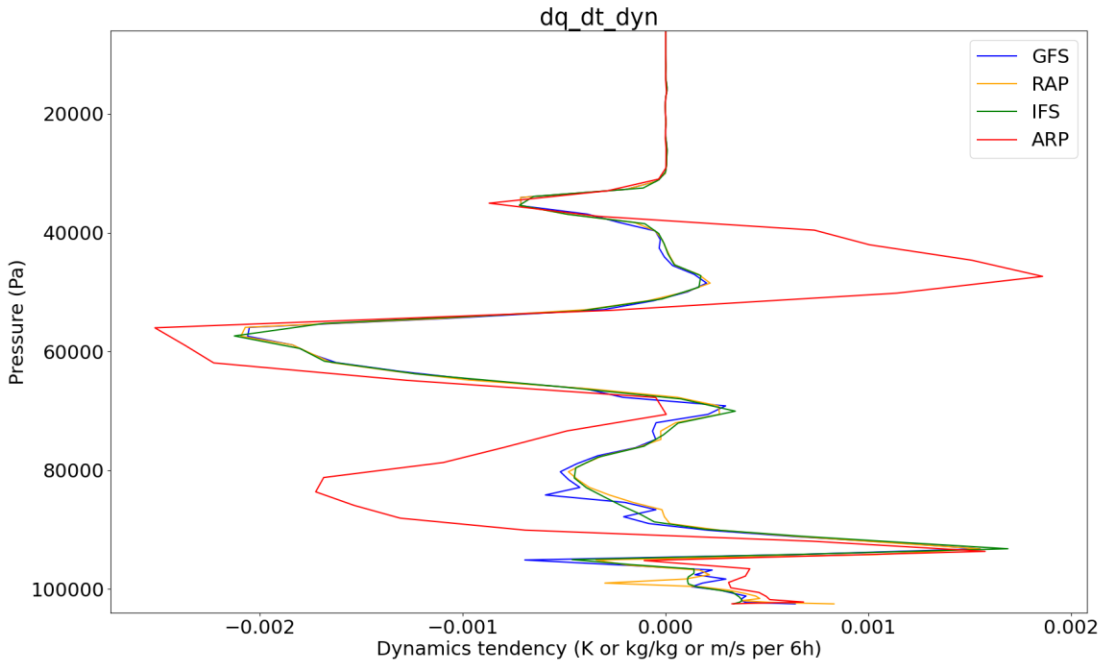
No cloud initially:



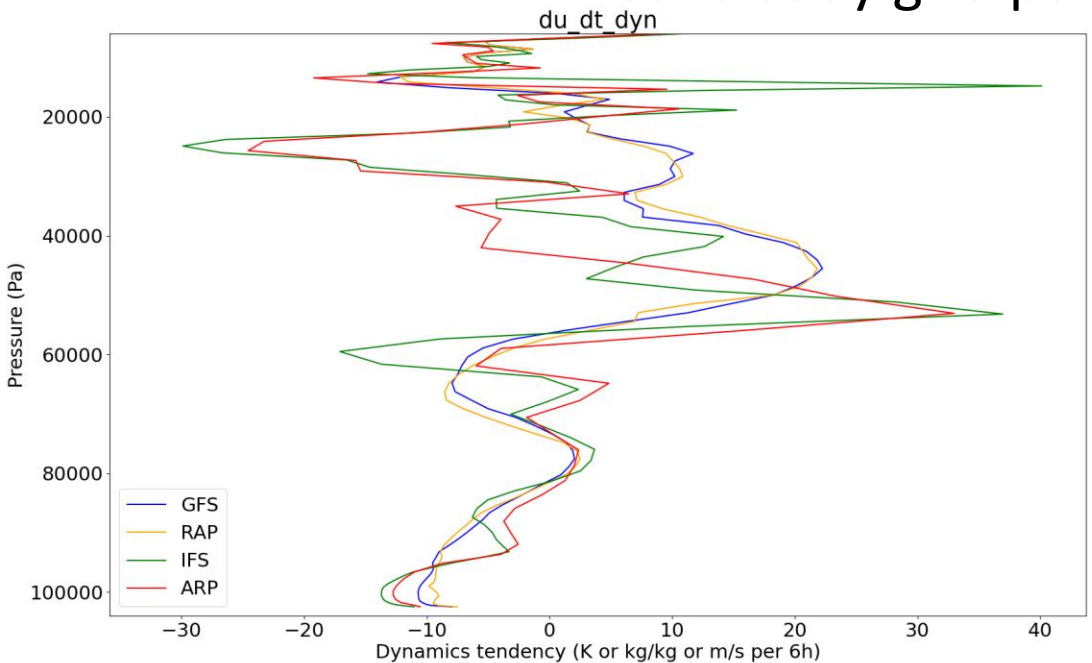


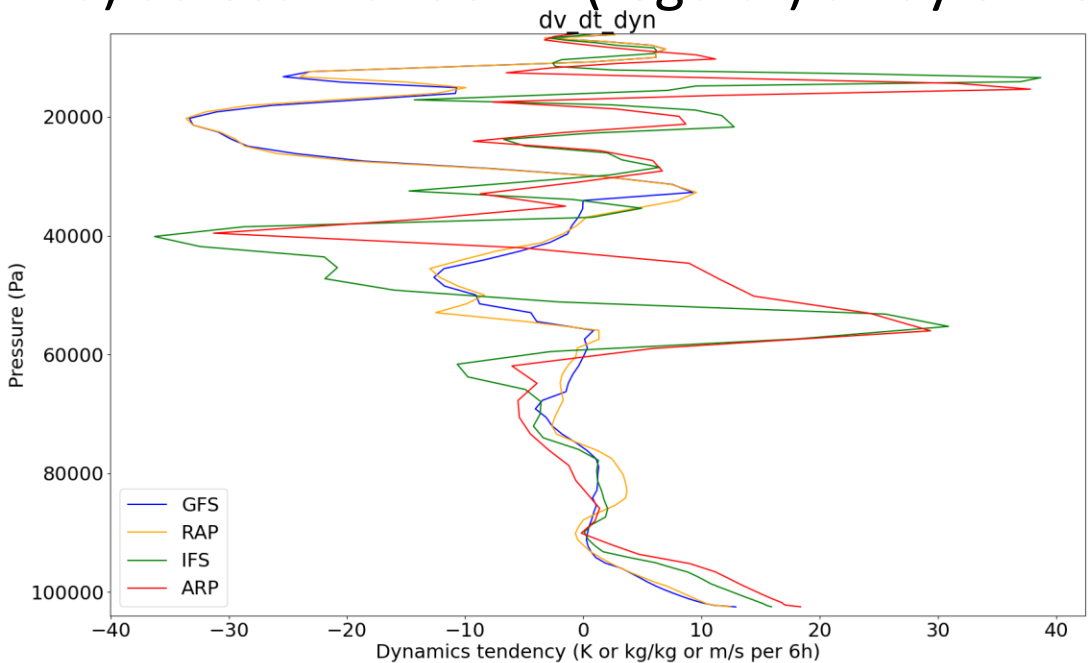


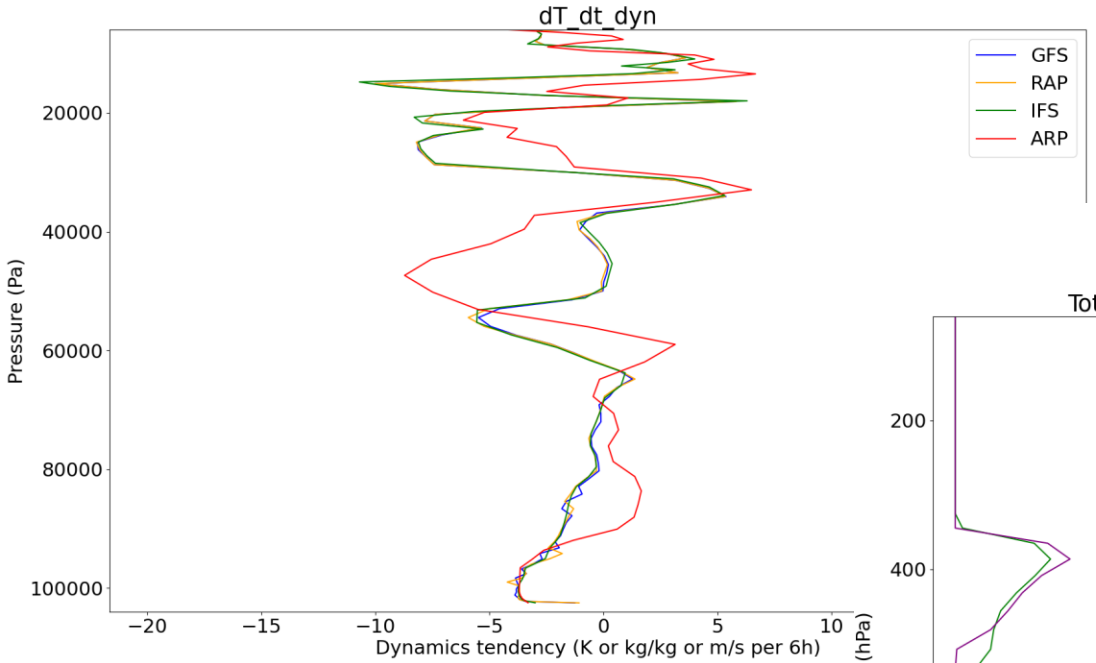


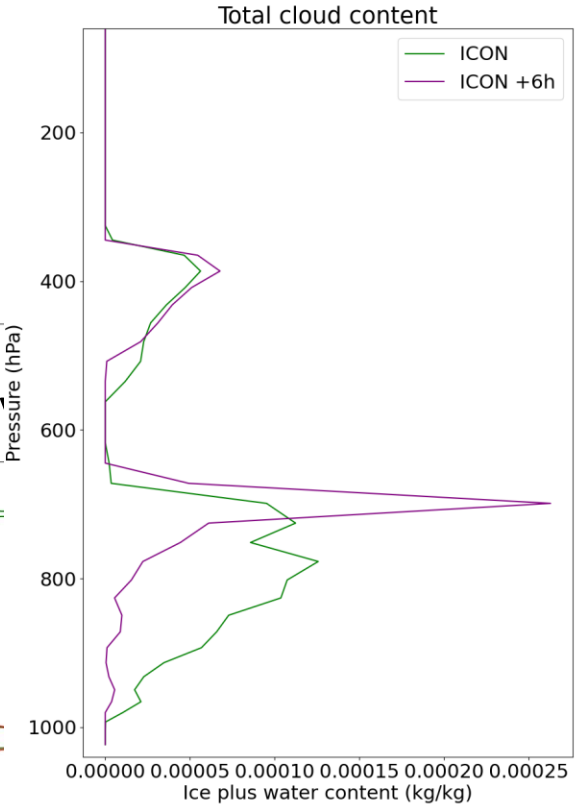


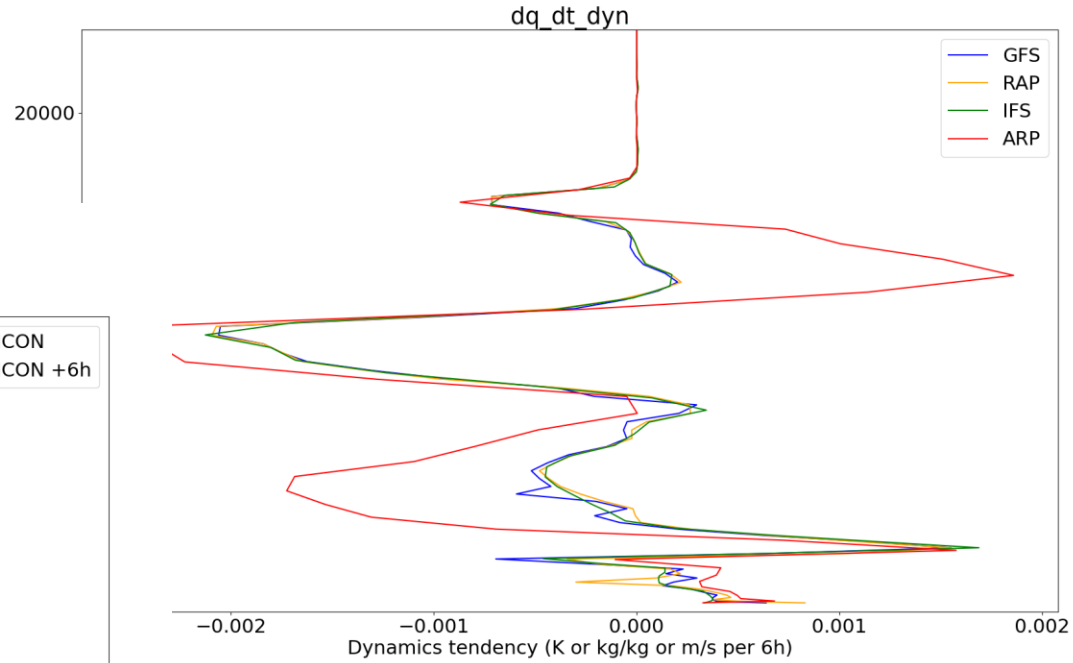
Most cloudy grid point (400 hPa) across “random” (regular) array of 10 poin





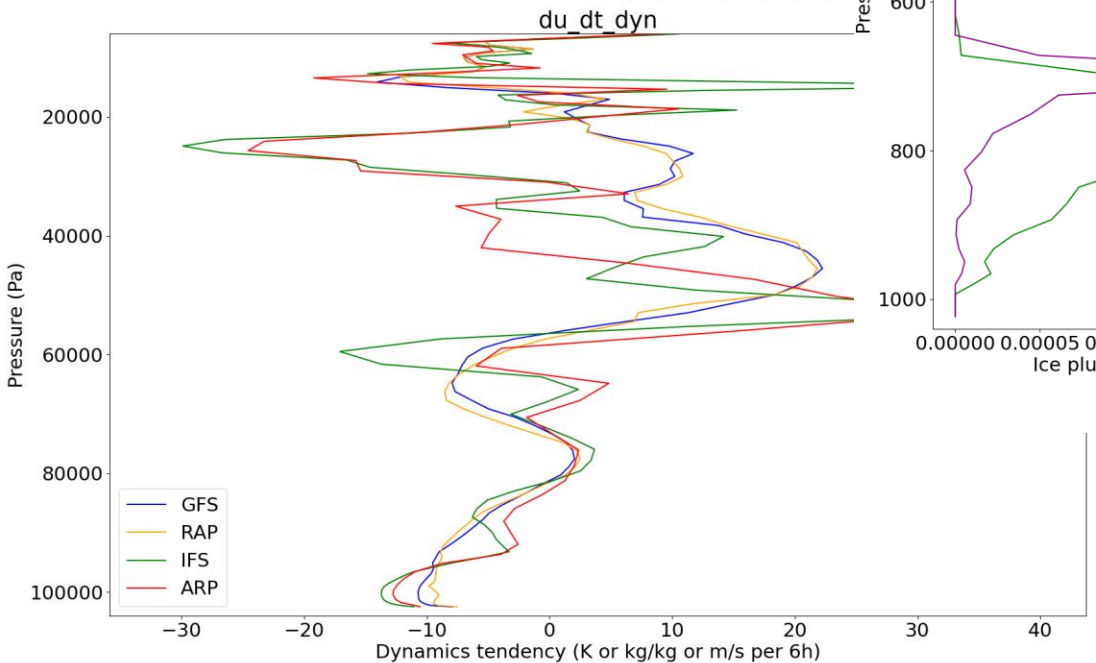


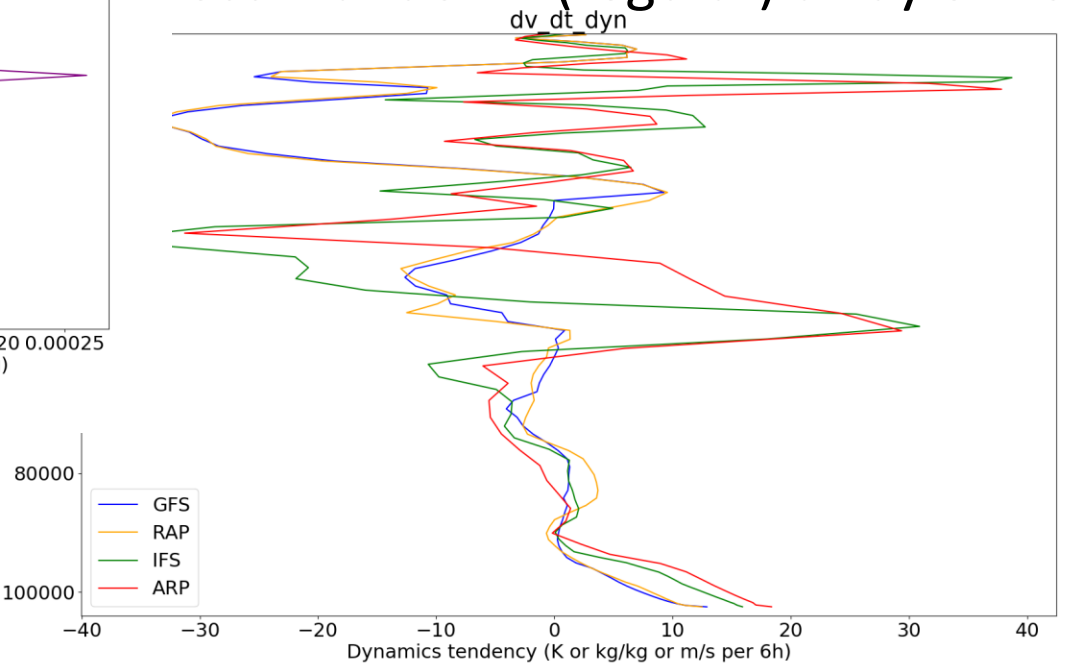


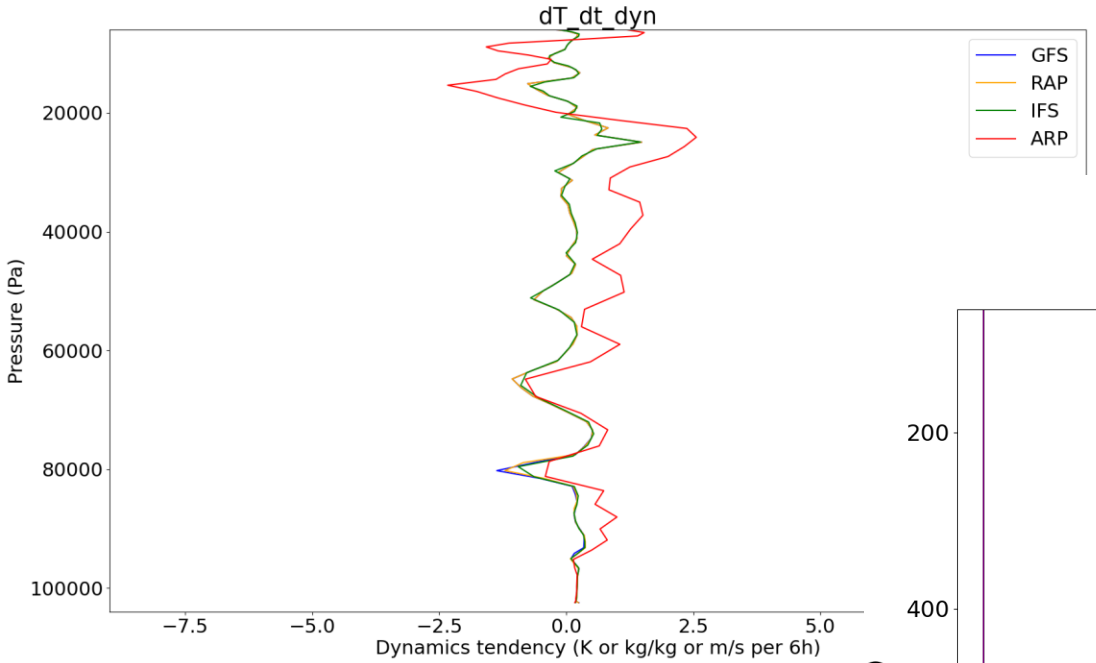


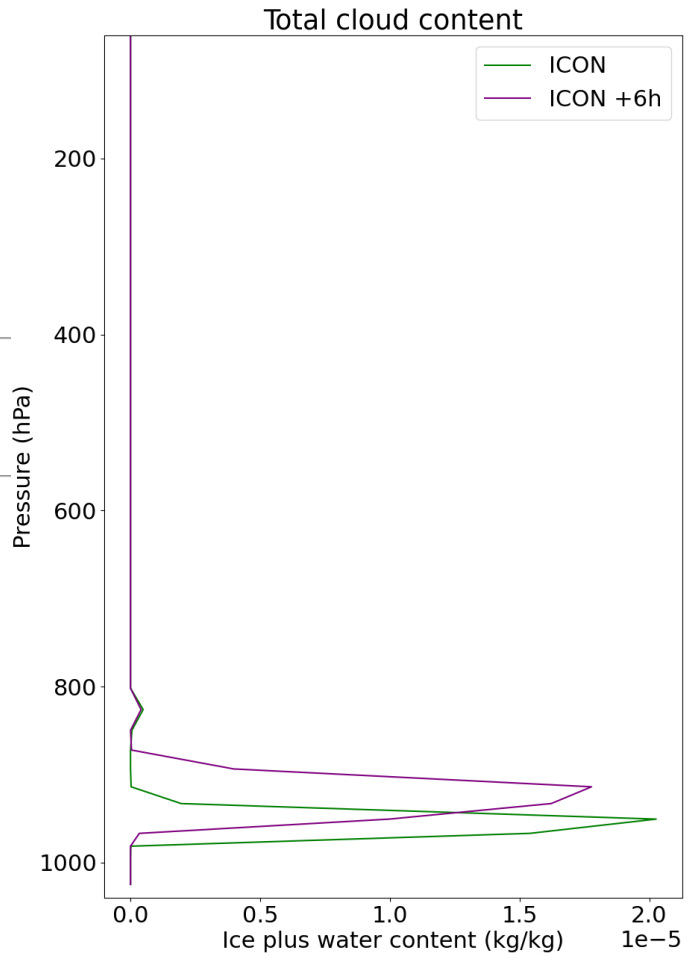
Most cloud

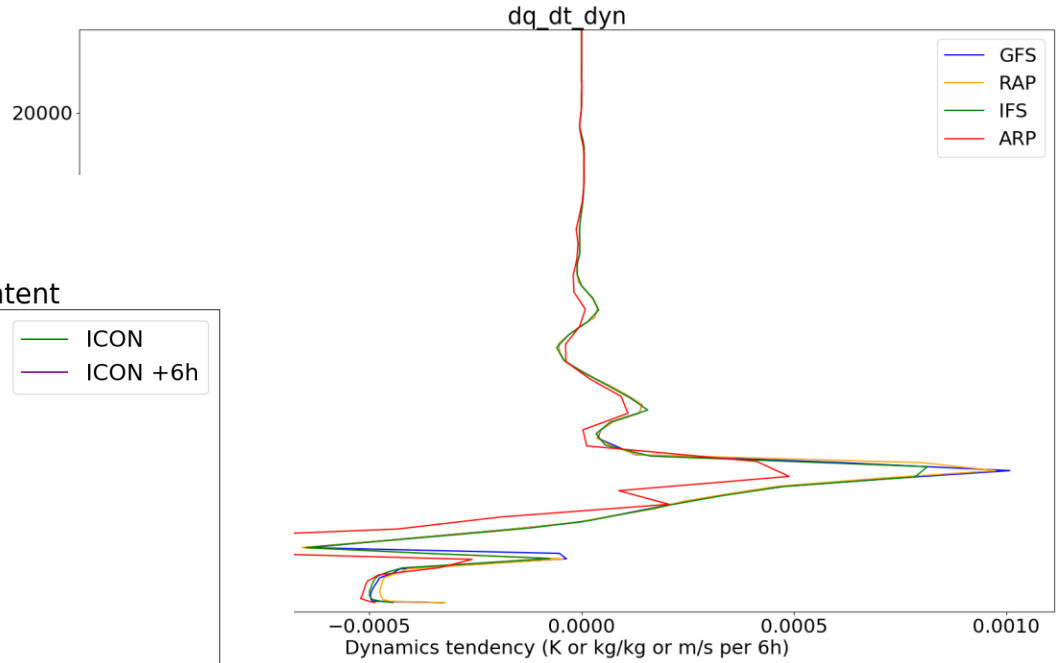
ross “random” (regular) array of 10 poin

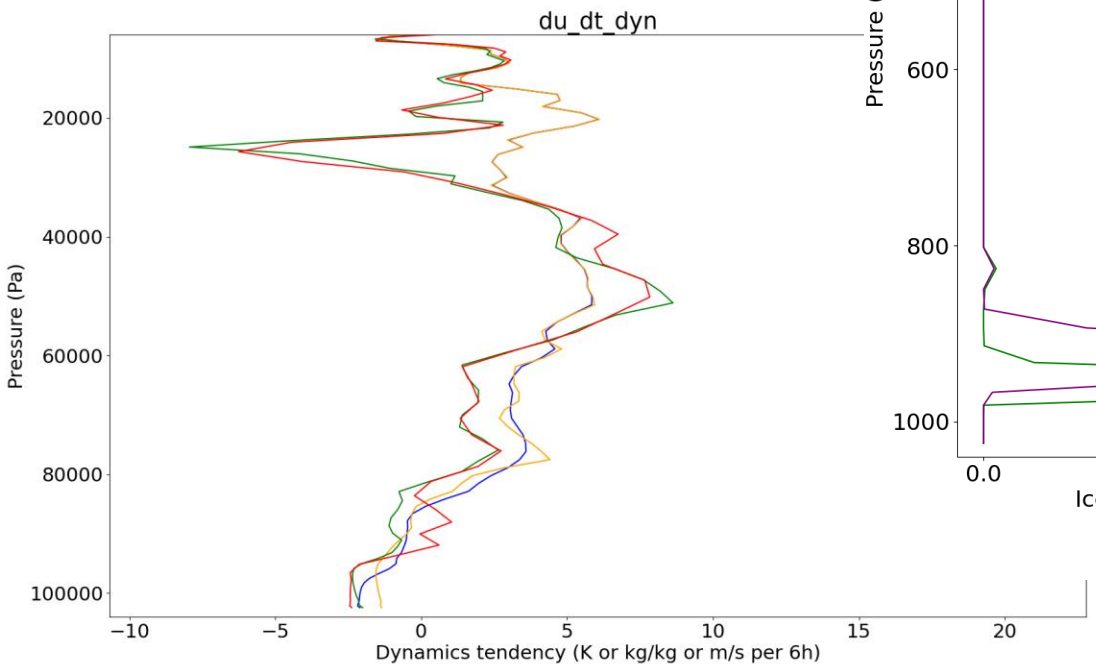


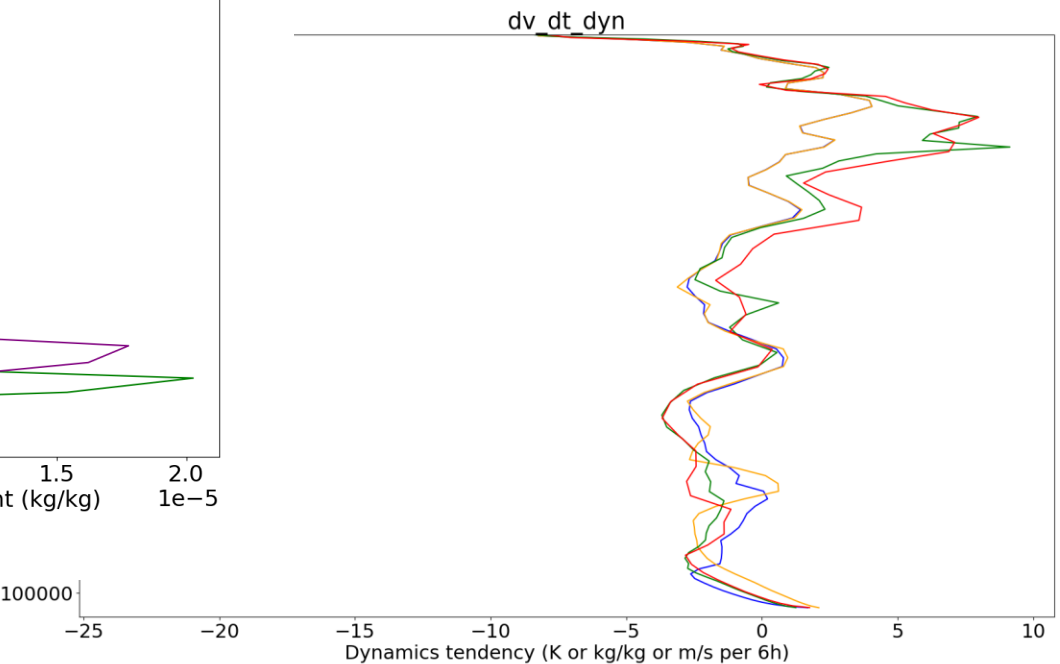


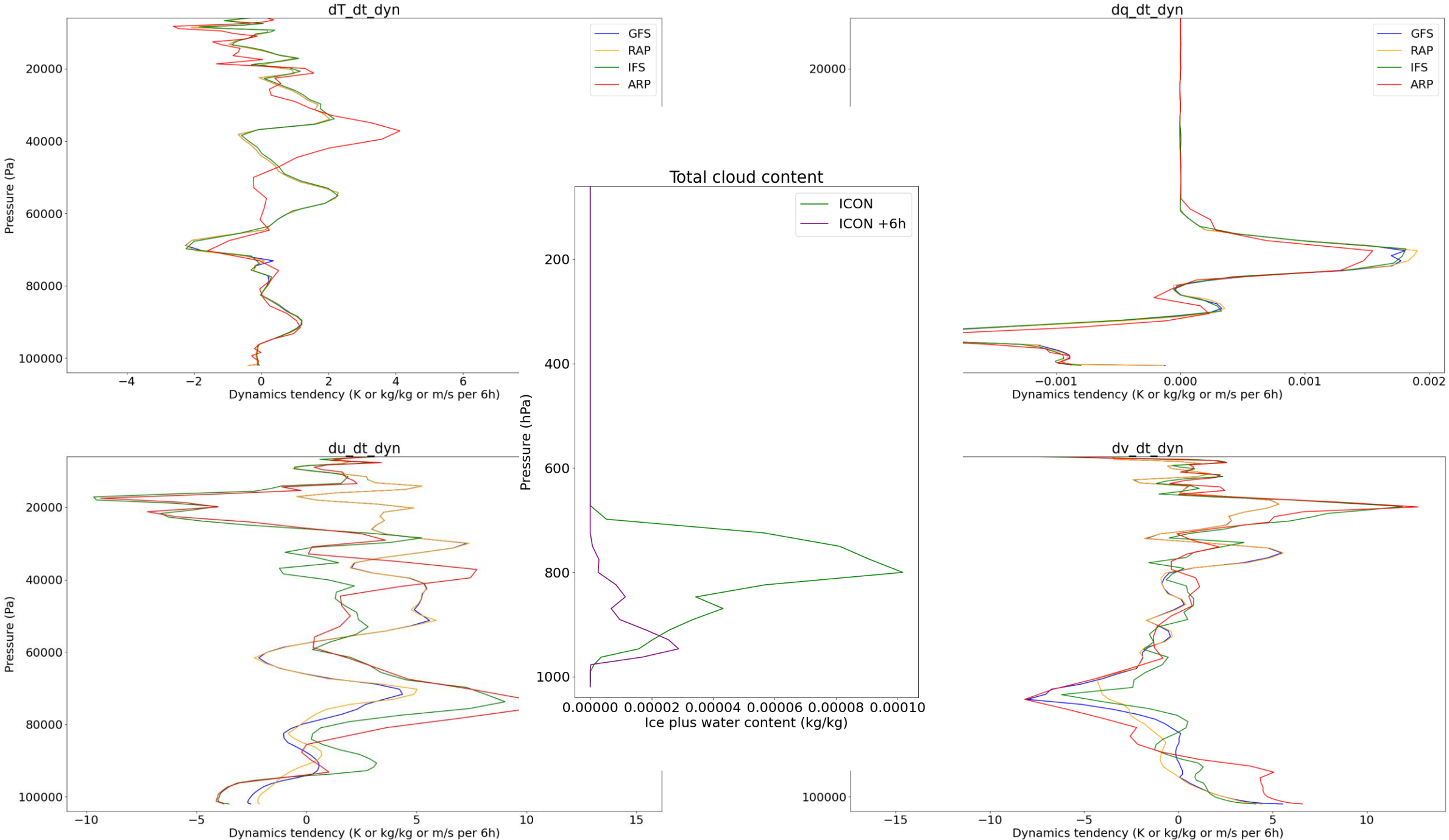

dT_dt_dyn
GFS
RAP
IFS
ARP
Pressure (Pa)
20000
40000
60000
80000
100000
−7.5
−5.0
−2.5
0.0
2.5
5.0
Dynamics tendency (K or kg/kg or m/s per 6h)


Total cloud content
ICON
ICON +6h
Pressure (hPa)
200
400
600
800
1000
0.0
0.5
1.0
1.5
2.0
1e−5
Ice plus water content (kg/kg)


dq_dt_dyn
GFS
RAP
IFS
ARP
20000
−0.0005
0.0000
0.0005
0.0010
Dynamics tendency (K or kg/kg or m/s per 6h)


du_dt_dyn
Pressure (Pa)
20000
40000
60000
80000
100000
−10
−5
0
5
10
15
20
Dynamics tendency (K or kg/kg or m/s per 6h)


dv_dt_dyn
100000
−25
−20
−15
−10
−5
0
5
10
Dynamics tendency (K or kg/kg or m/s per 6h)


dT_dt_dyn
GFS
RAP
IFS
ARP
Pressure (Pa)
20000
40000
60000
80000
100000
−4
−2
0
2
4
6
Dynamics tendency (K or kg/kg or m/s per 6h)
dq_dt_dyn
GFS
RAP
IFS
ARP
20000
−0.001
0.000
0.001
0.002
Dynamics tendency (K or kg/kg or m/s per 6h)
Total cloud content
ICON
ICON +6h
Pressure (hPa)
200
400
600
800
1000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Ice plus water content (kg/kg)
du_dt_dyn
Pressure (Pa)
20000
40000
60000
80000
100000
−10
−5
0
5
10
15
Dynamics tendency (K or kg/kg or m/s per 6h)
dv_dt_dyn
100000
−15
−10
−5
0
5
10
Dynamics tendency (K or kg/kg or m/s per 6h)

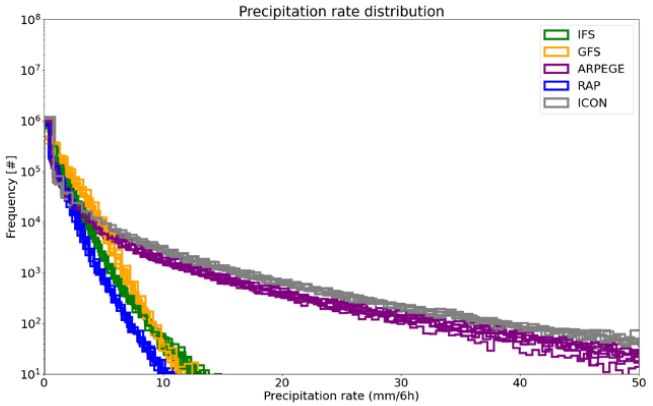
ARPEGE

- What algorithm is exactly used for ARPEGE initialisation?
- Can we rerun a subset with alternative initialization?
- Would the precipitation statistics match IFS/GFS better, if the same initialisation procedure were applied?

- If for ARPEGE T is adjusted to “before condensation”,

→ ∇T has probably been recomputed??

→Changes advection of T??



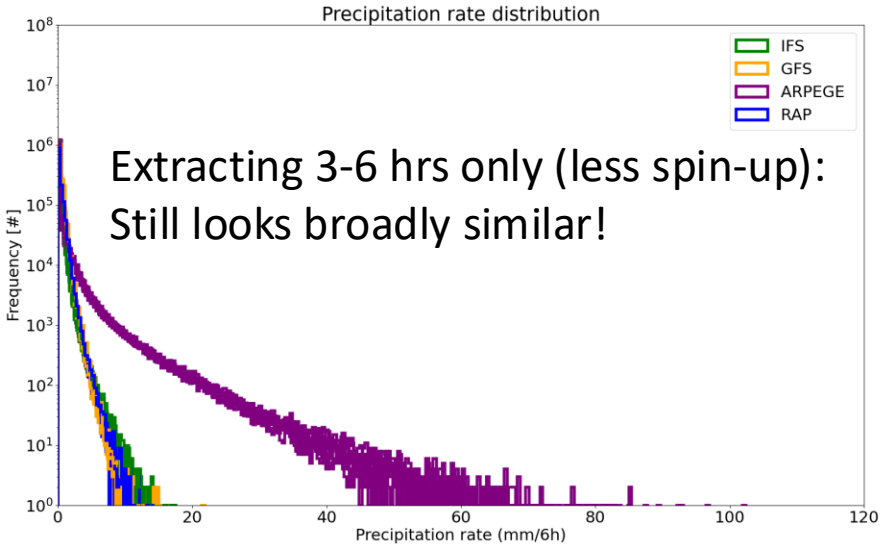
Changing physical AND dynamical tendencies of T is also associated with changes in dynamical tendencies of u,v: since differential heating by physics drives the gradients of T and divergence/convergence. Furthermore, T tendencies affect pressure. To reset to “pre-cloud”–state, one might also redo momentum and geostrophic advection (ok, far-fetching!).

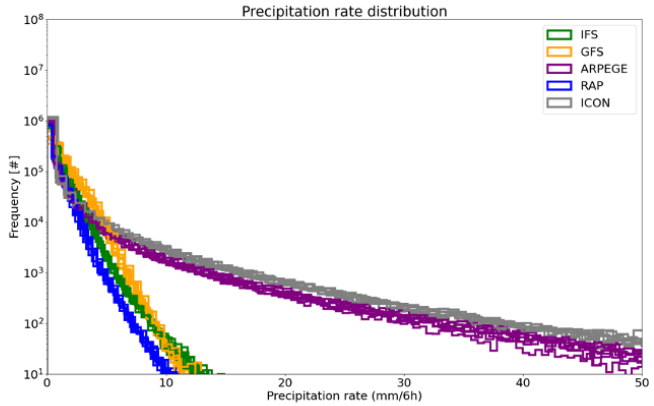
ARPEGE

- What algorithm is exactly used for ARPEGE initialisation?
- Can we rerun a subset with alternative initialization?
- Wo ter, if the same initialisation procedure were app
- If fo ,

→ ∇T

→Cha





Chang so associated with changes in dynamical tendencies of u,v: since differential heating by physics drives the gradients of T and divergence/convergence. Furthermore, T tendencies affect pressure. To reset to “pre-cloud”–state, one might also redo momentum and geostrophic advection (ok, far-fetching!).

GFS/RAP

- GFS and RAP with smoothened dynamics (denoising…)?

→ Would this an internal effect within the SCMs or has it been possible to manage this noise?

→ Could there be a vertical shift between T/q tendencies and u/v tendencies (compared to ICON data) perhaps?

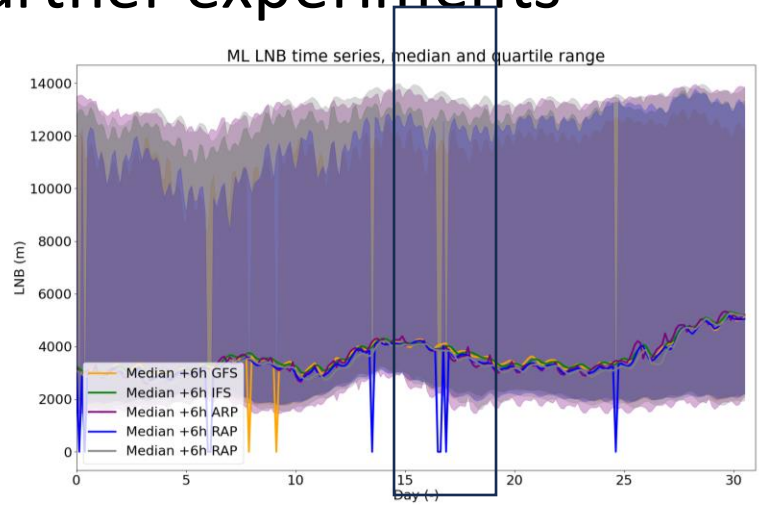
Suggestion

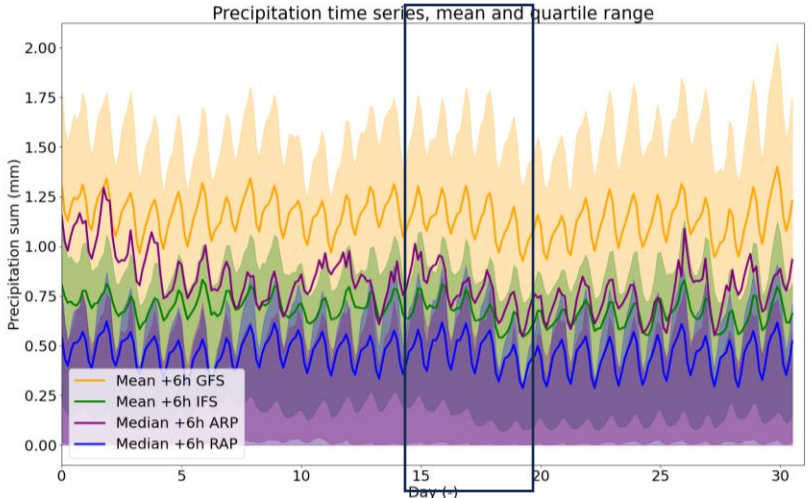
- We may use a common subset for a few further experiments

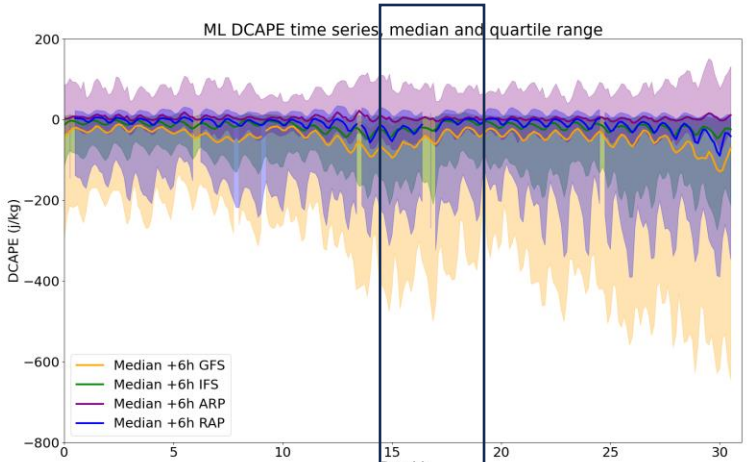
What I have run with alternative namelist:

25th, 26th, 27th, 28th, 29th

Each of them starting 00 and 12 UTC

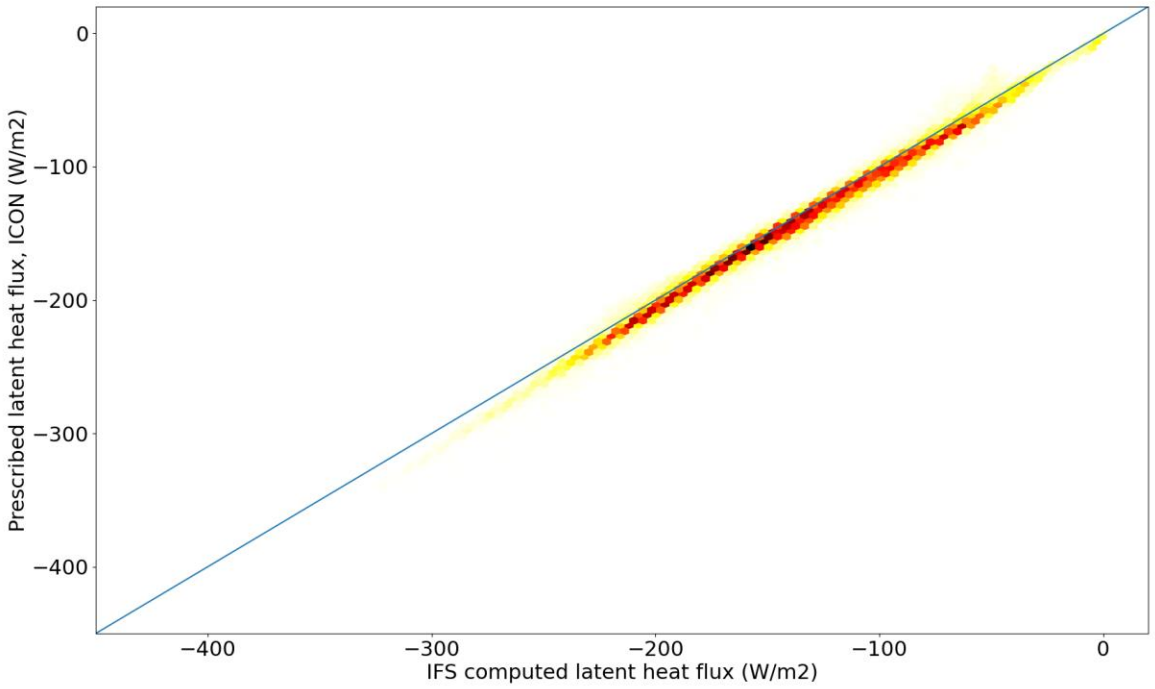


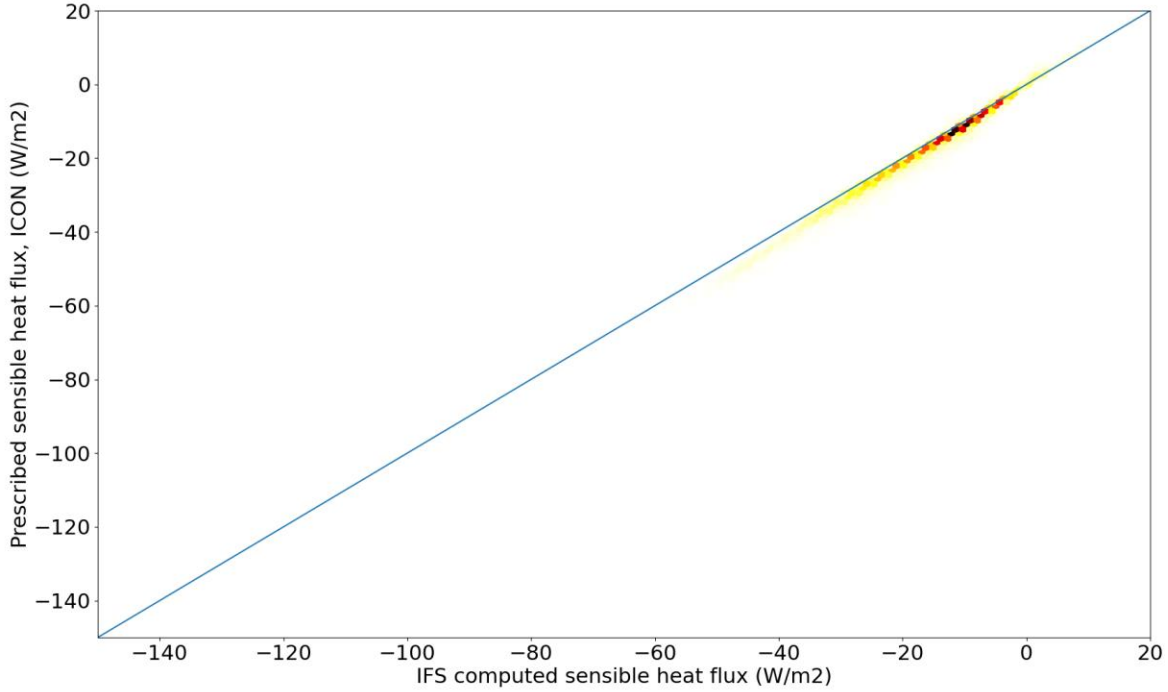




Comparison of two surface couplings, flux vs. flux + SST

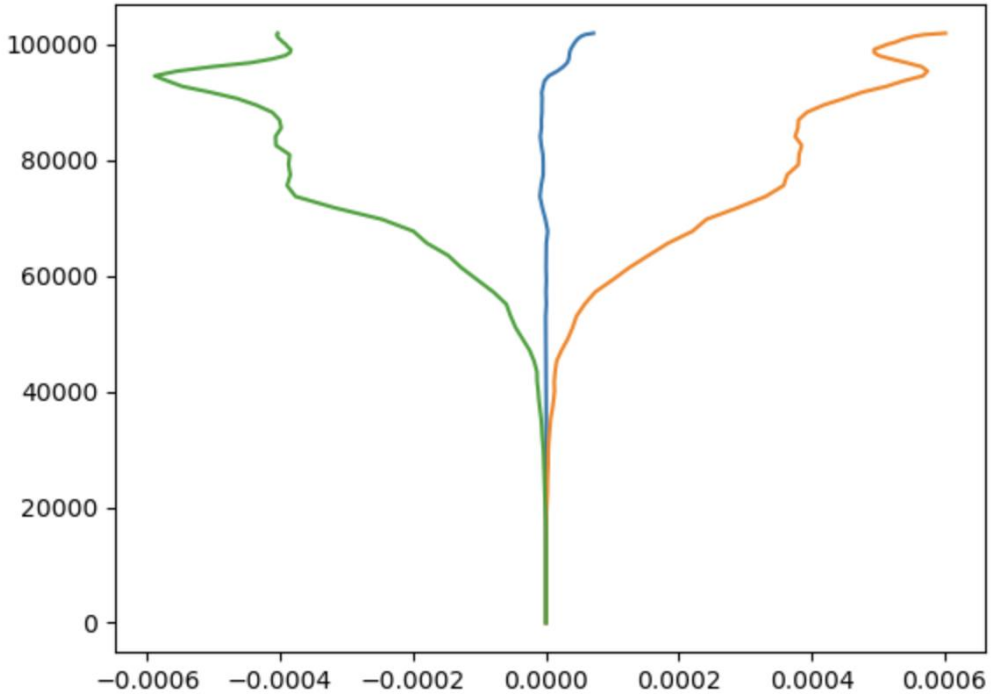
- 30 mins accumulation

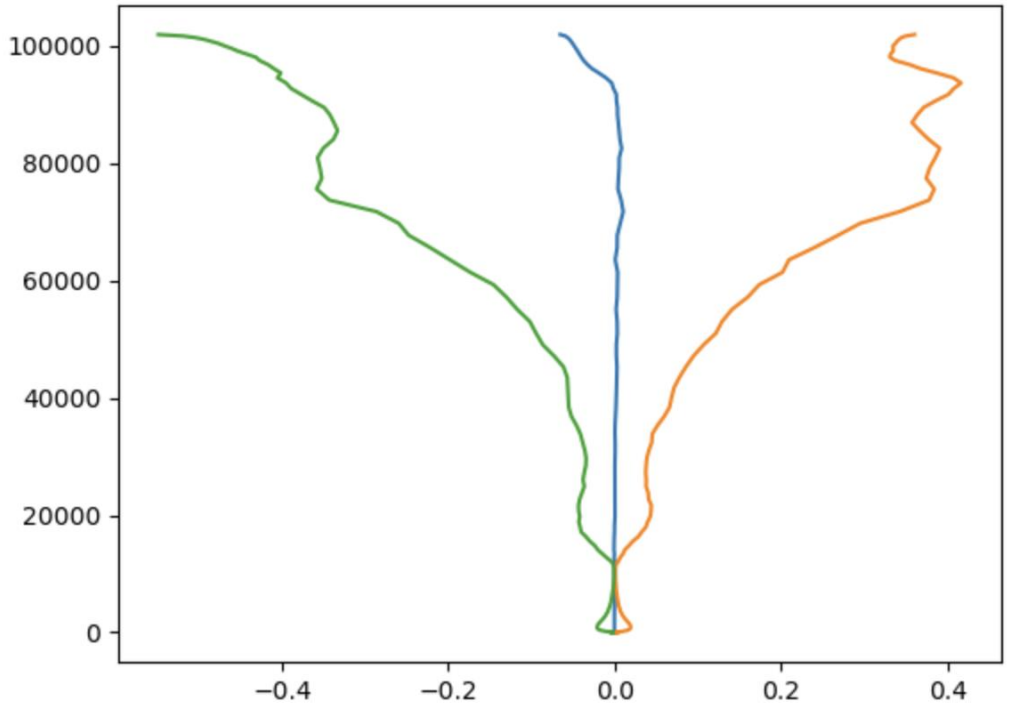




Temperature profile differences

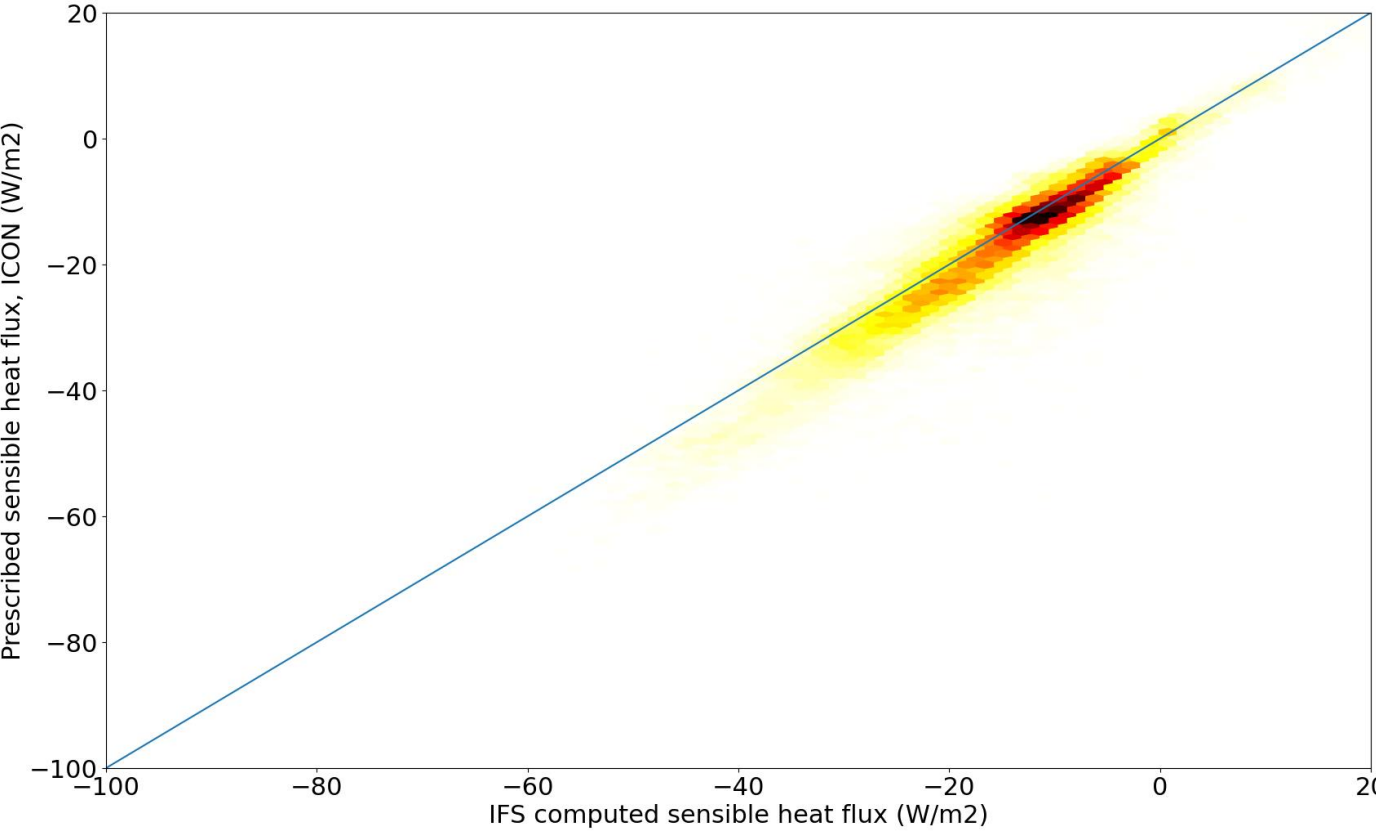
- Default vs. ICON-forced namelists
- Lines indicate mean, 5th and 95th percentile at each pressure level

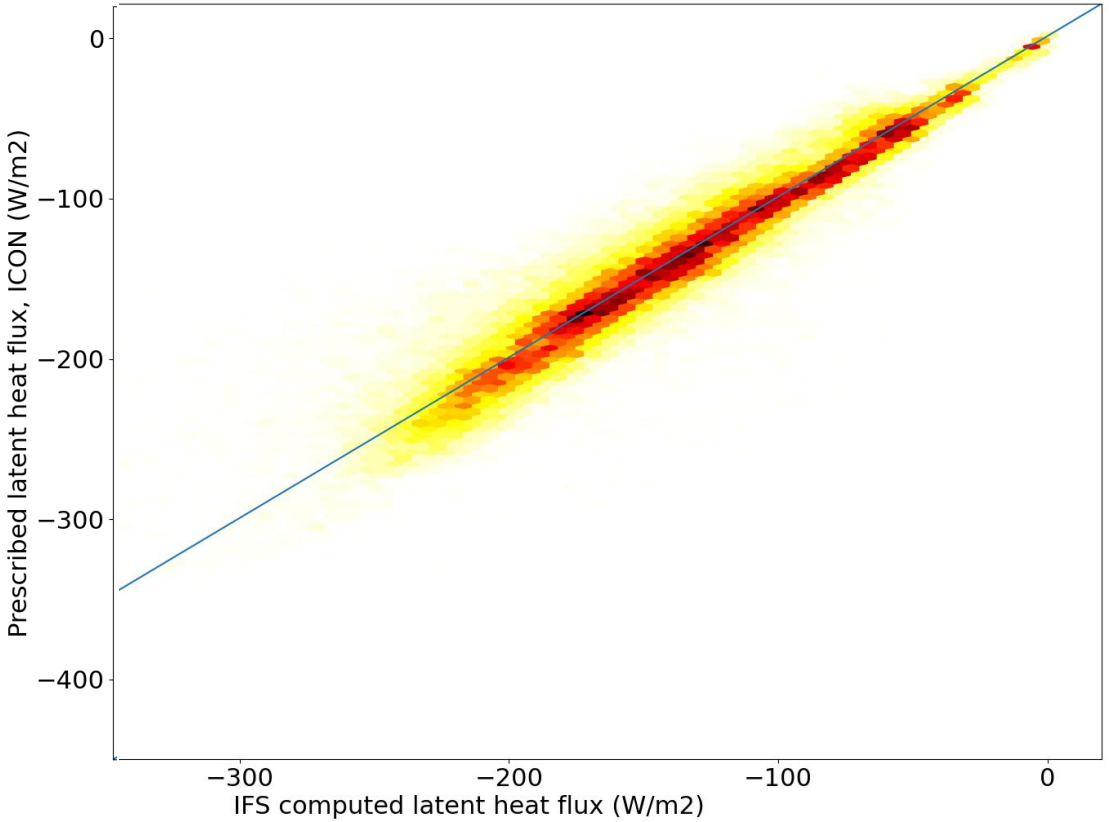




Comparison of two surface couplings

- 6h accumulation fluxes





Further MUMIP matters

- Other alternative namelist shows comparable results

(slightly larger deviations u, v, q, because of stationary rather than moving pressure systems, but slightly weaker T perturbations)

Also

→Preparing 1-2 manuscripts based on poster September and MUMIP work (also in EGU abstract)

Probably we need to compile a structure like a technical report about MUMIP datasets