Composite Case: Intercomparision of Single Column Models

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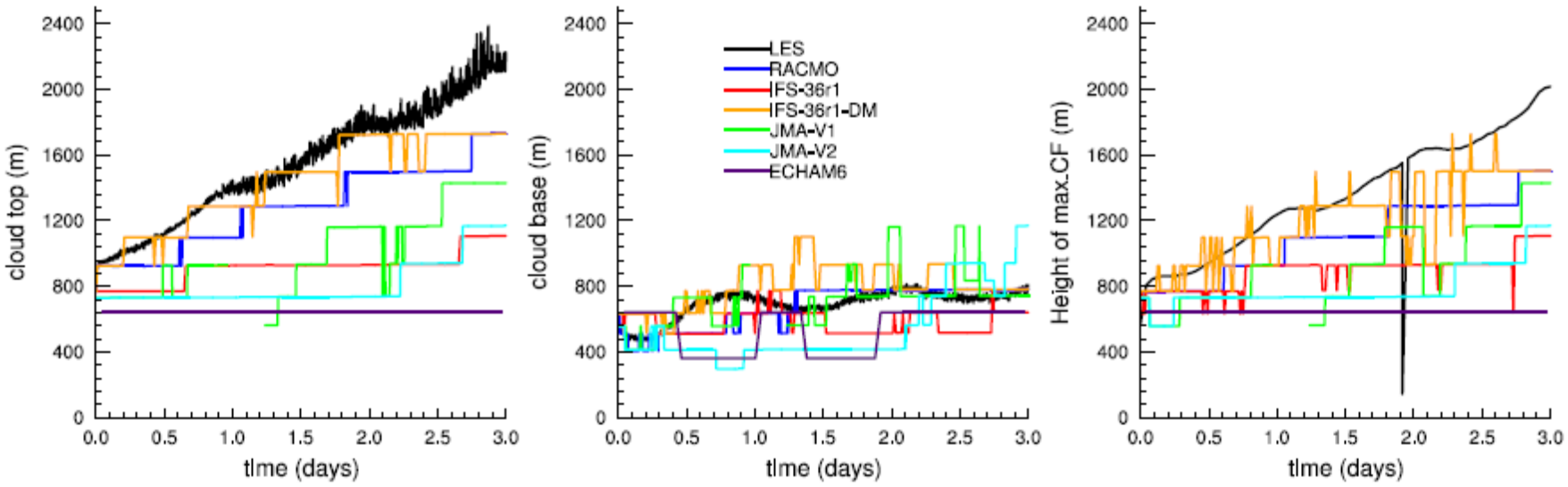
Goal: To translate our understanding of transitions in cloudiness from observations and LES models to climate models through single column models.

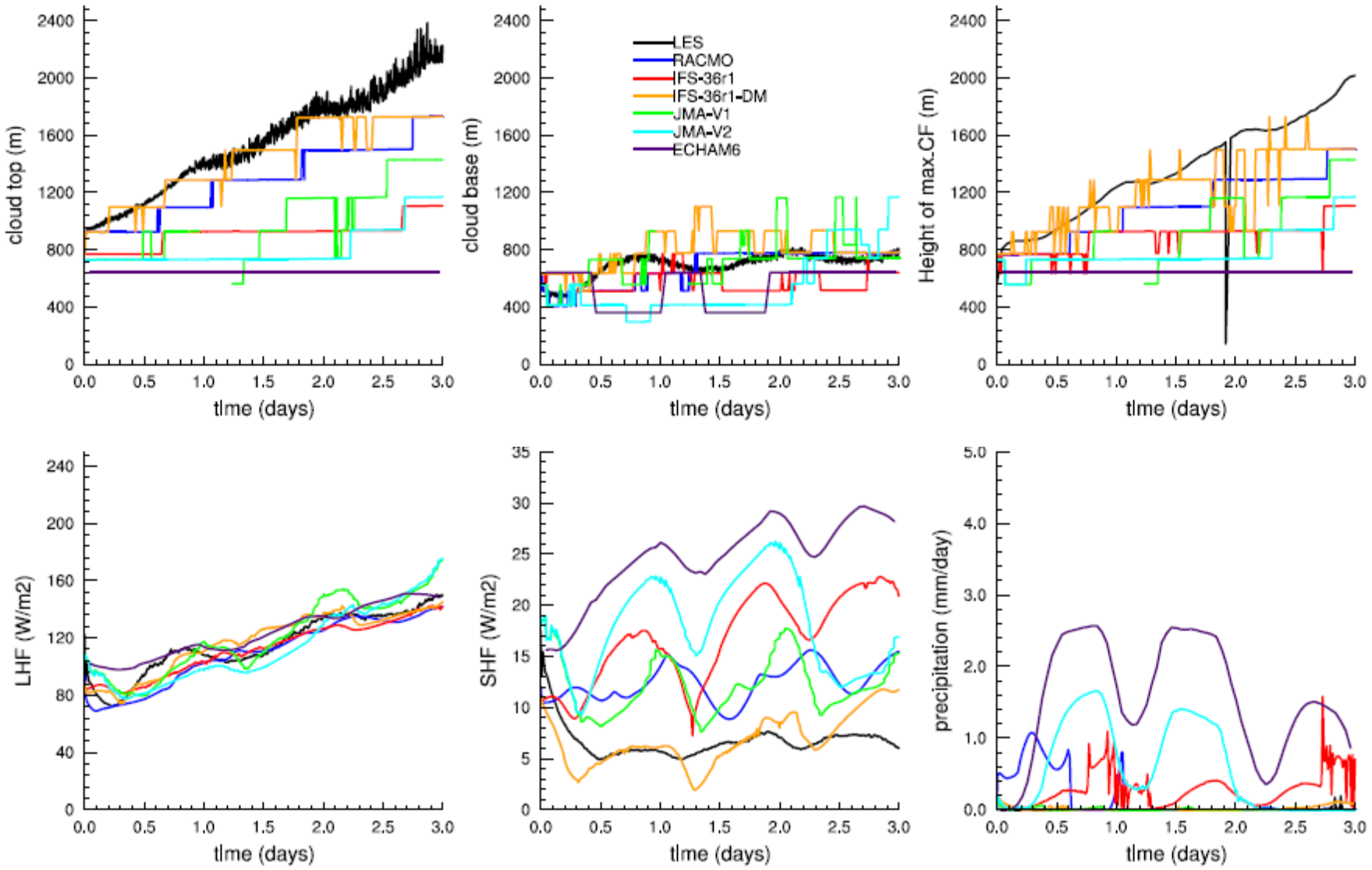
Model	PBL Scheme	Vertical Levels:Under 1km	Cloud
RACMO (Sara, Pier)	DM-flux	91 : 13	Prognostic, stat
IFS-36r1 (Martin , Irina)	K-profile/expl entr.		Prognistic
IFS-36r1-DM (Martin)	DM-flux		Prognostic
JMA1 (Hideaki Kawai)	Mellor-Yamada	60 : 10	Stat(Smith)
JMA2 (Hideaki Kawai)	Mellor-Yamada,expl entr		Stat(Smith)
ECHAM6 (Suvarchal, Bjorn)	TKE-moist	31 : 5	Prog,Stat (Tompkins 2002)

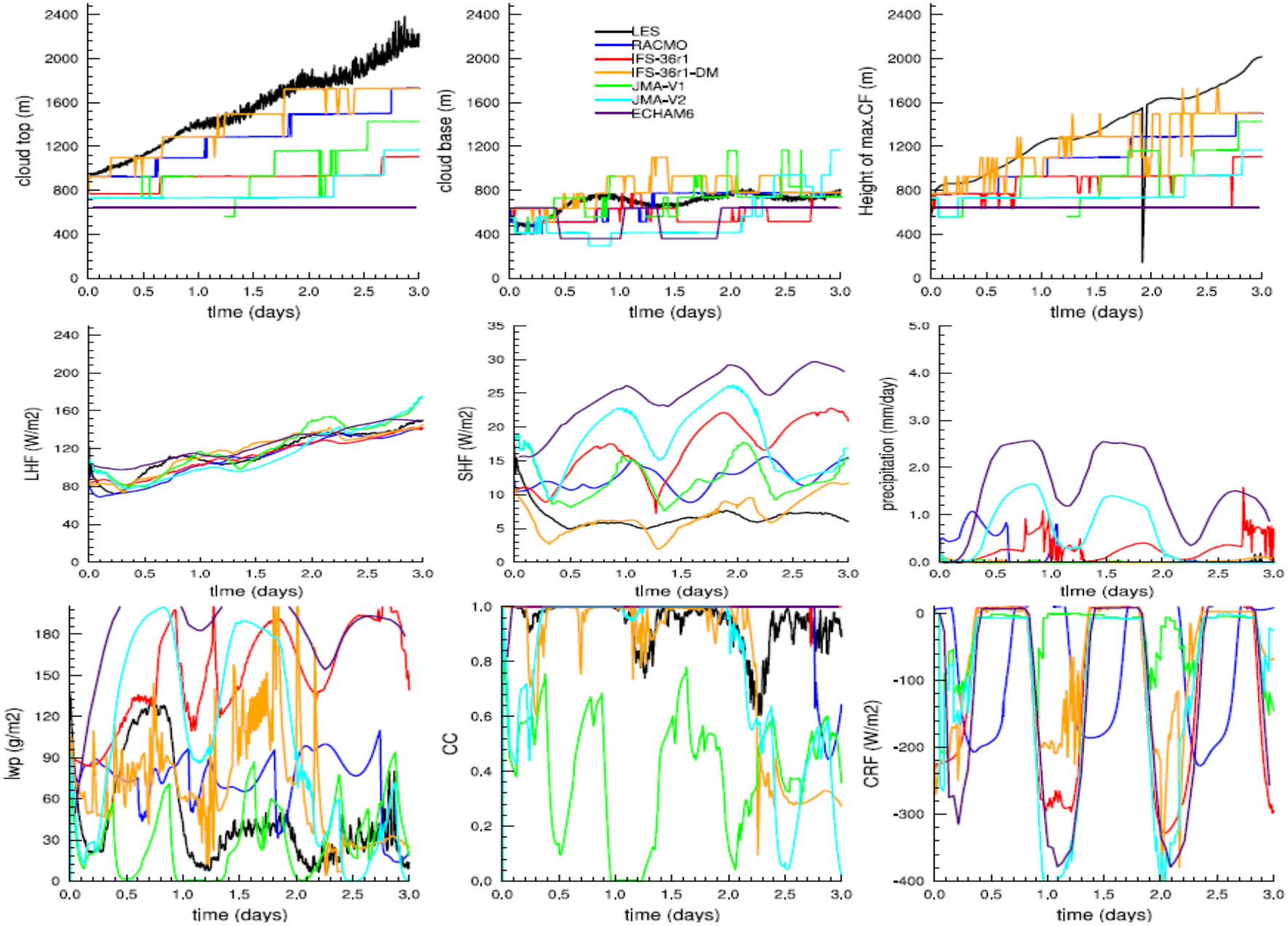
There is more space for you!

Reference case

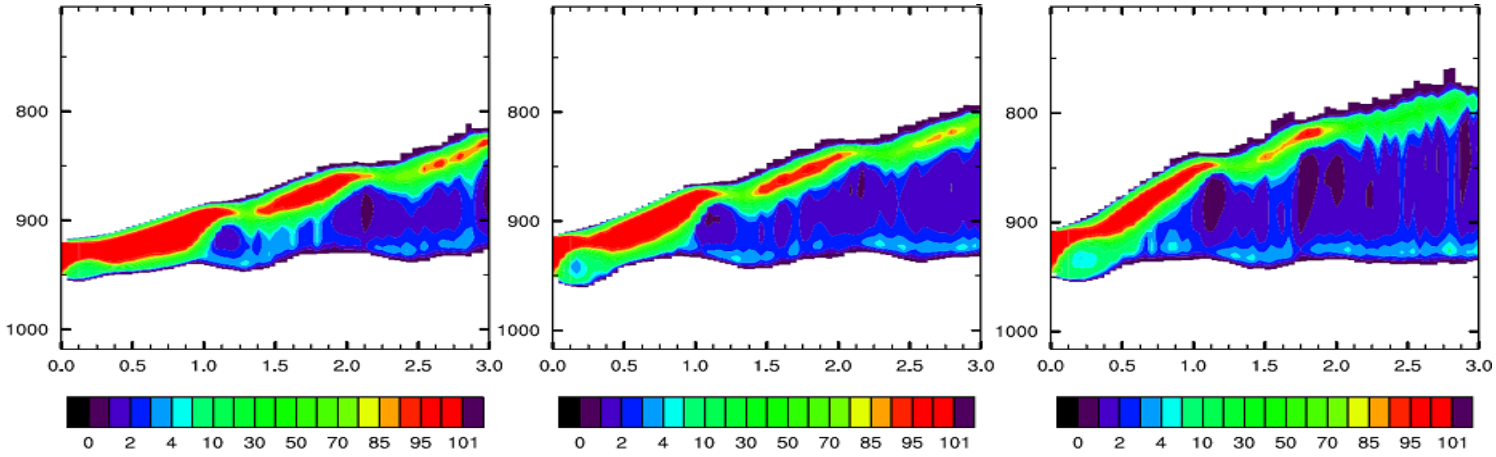


Reference case

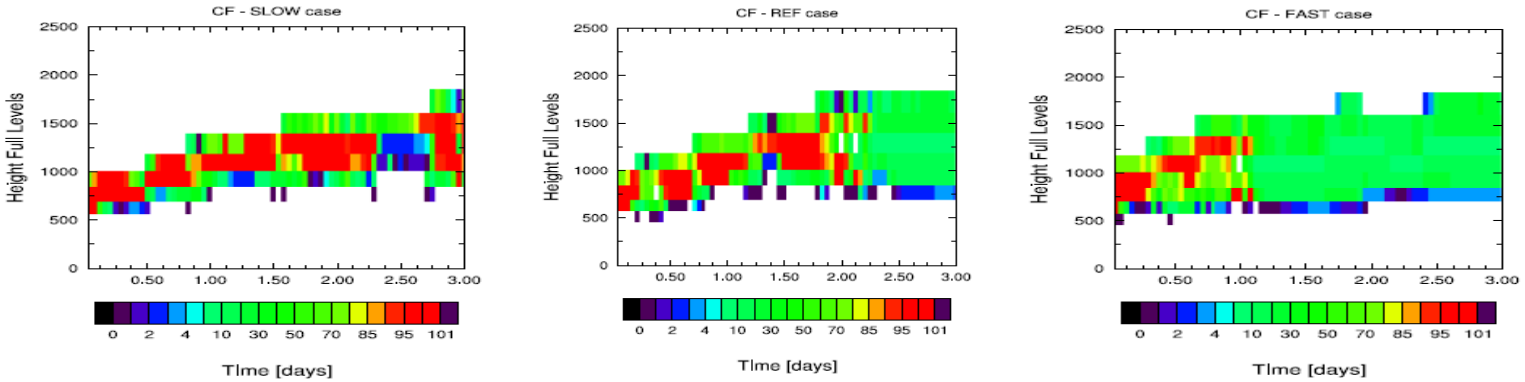



cloud top (m)
time (days)
cloud base (m)
time (days)
LES
RACMO
IFS-36r1
IFS-36r1-DM
JMA-V1
JMA-V2
ECHAM6
Height of max.CF (m)
time (days)
LHF (W/m2)
time (days)
SHF (W/m2)
time (days)
precipitation (mm/day)
time (days)
lwp (g/m2)
time (days)
CC
time (days)
CRF (W/m2)
time (days)

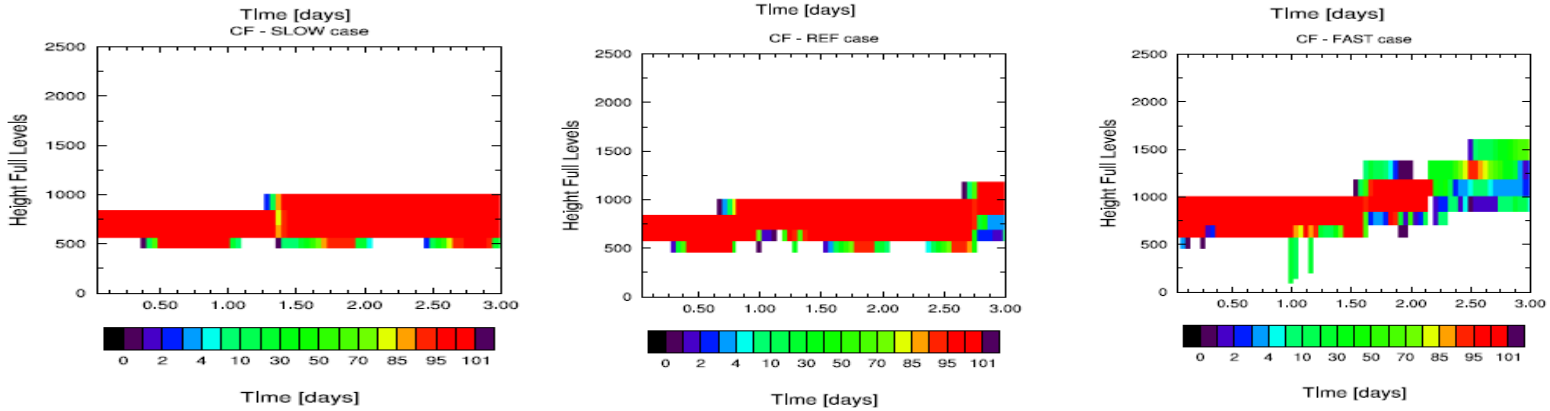
LES


800
900
1000
0.0 0.5 1.0 1.5 2.0 2.5 3.0
0 2 4 10 30 50 70 85 95 101
Time [days]

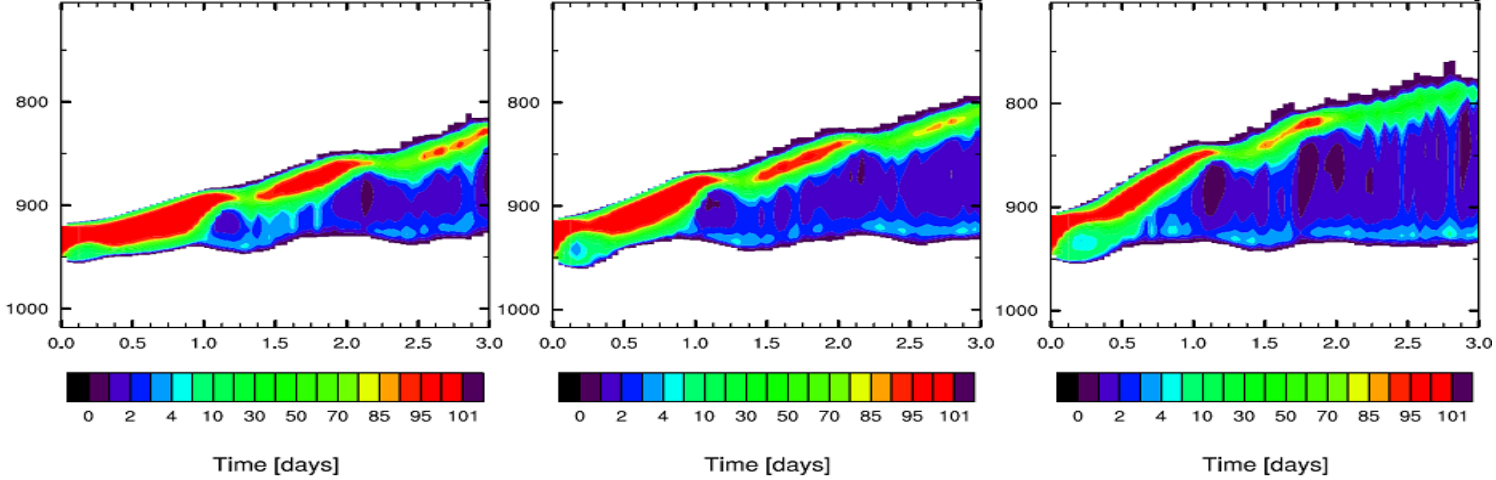
I-DM


CF - SLOW case
CF - REF case
CF - FAST case
Height Full Levels
2500
2000
1500
1000
500
0
0.50 1.00 1.50 2.00 2.50 3.00
0 2 4 10 30 50 70 85 95 101
Time [days]

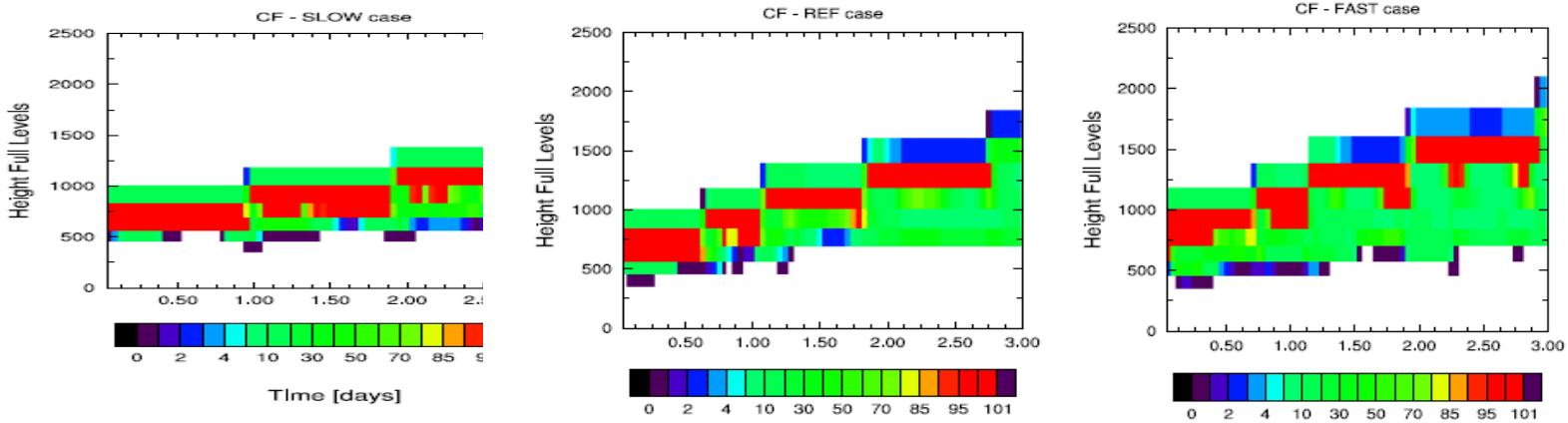
IFS


CF - SLOW case
CF - REF case
CF - FAST case
Height Full Levels
2500
2000
1500
1000
500
0
0.50 1.00 1.50 2.00 2.50 3.00
0 2 4 10 30 50 70 85 95 101
Time [days]

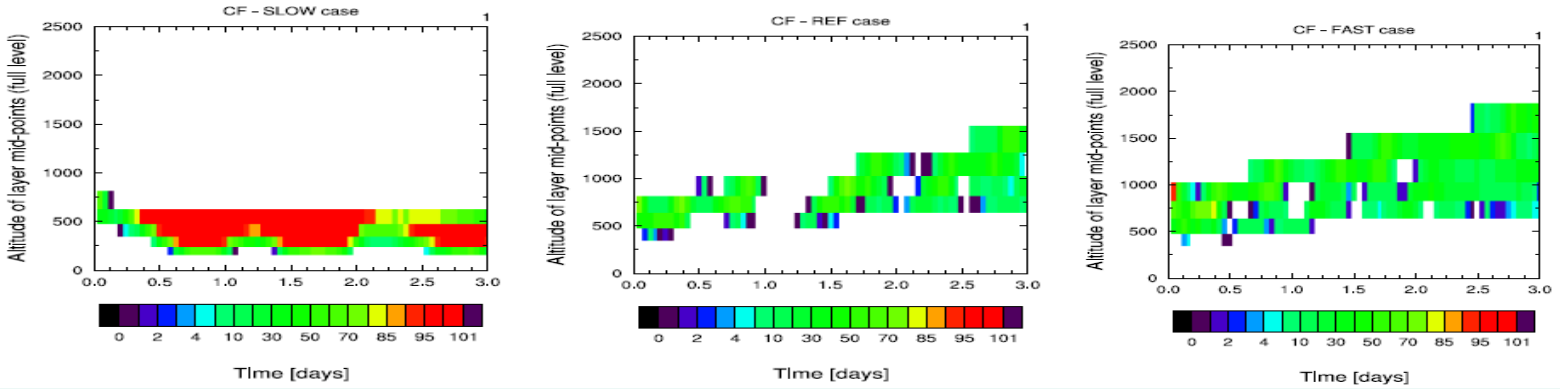
LES


800
900
1000
0.0 0.5 1.0 1.5 2.0 2.5 3.0
0 2 4 10 30 50 70 85 95 101
Time [days]

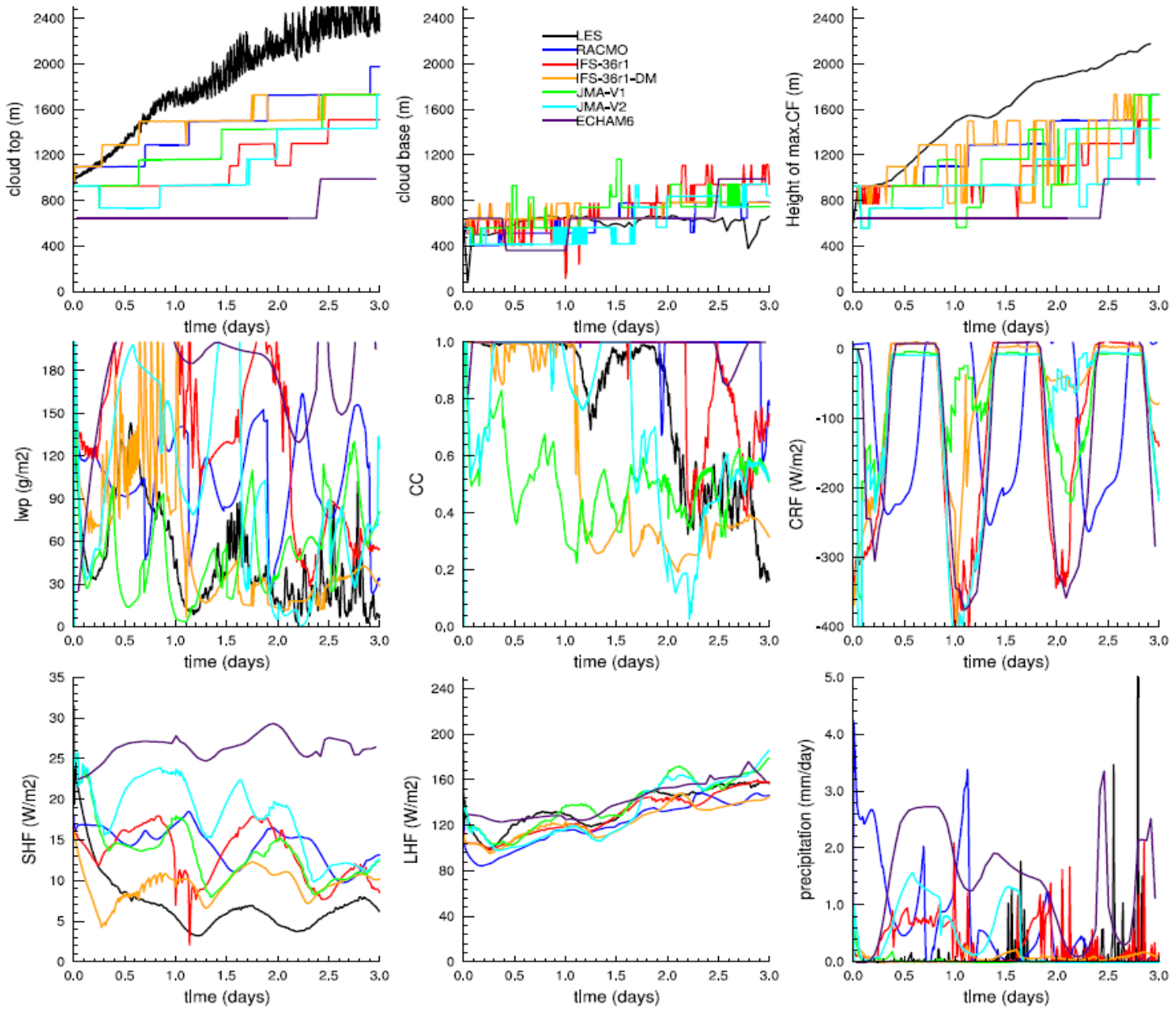
RAC


CF - SLOW case
CF - REF case
CF - FAST case
Height Full Levels
2500
2000
1500
1000
500
0
0.50 1.00 1.50 2.00 2.50 3.00
0 2 4 10 30 50 70 85 95 101
Time [days]

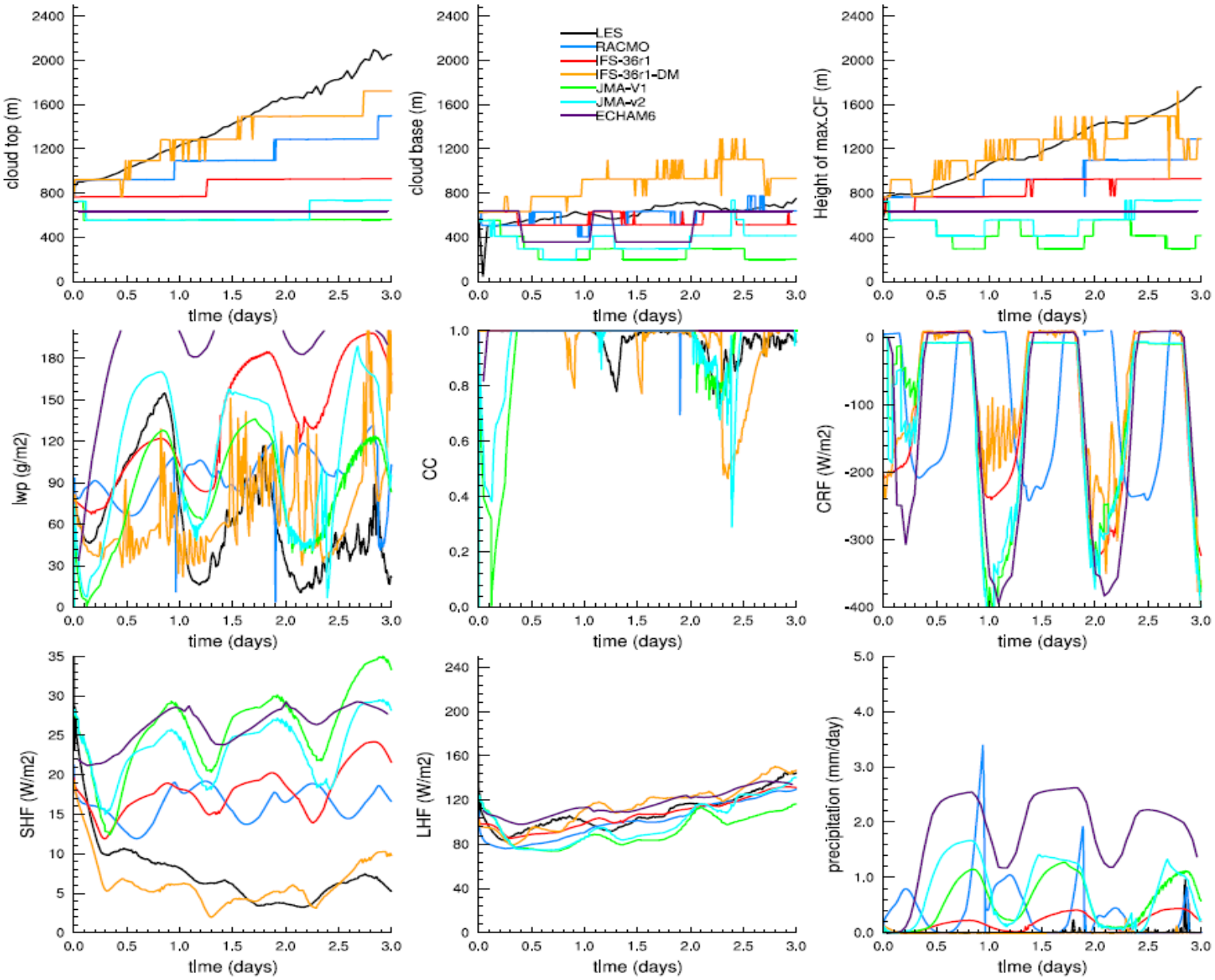
LES


CF - SLOW case
CF - REF case
CF - FAST case
Altitude of layer mid-points (full level)
2500
2000
1500
1000
500
0
0.0 0.5 1.0 1.5 2.0 2.5 3.0
0 2 4 10 30 50 70 85 95 101
Time [days]

Fast


cloud top (m)
cloud base (m)
Height of max.CF (m)
LES
RACMO
IFS-36r1
IFS-36r1-DM
JMA-V1
JMA-V2
ECHAM6
time (days)
lwp (g/m2)
CC
CRF (W/m2)
SHF (W/m2)
LHF (W/m2)
precipitation (mm/day)

Slow


LES
RACMO
IFS-36r1
IFS-36r1-DM
JMA-V1
JMA-v2
ECHAM6
cloud top (m)
cloud base (m)
Height of max.CF (m)
lwp (g/m2)
CC
CRF (W/m2)
SHF (W/m2)
LHF (W/m2)
precipitation (mm/day)
time (days)

Future....

→ Future looks promising, participate in the ongoing Intercomparisions.

→ lets synchronize more in the case setup.

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