COSMO-B benchmark in Piemonte

Massimo Milelli
Valeria Garbero

PIEMONTE
Agenzia Regionale per la Protezione Ambientale

Sistema Nazionale per la Protezione dell'Ambiente

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Presidenza del Consiglio dei Ministri
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Overview of the work

- Model version: 5.04e
- Domain: operational COSMO-I7
- Namelists: operational COSMO-I7
- Forecast time: +48h
- Boundary frequency: 3h, from IFS
- Output frequency: 1h
- Data assimilation: no (cold start)
- Case study: 18 May 2017
- Number of cores: 64 (8x8)
- Simulation 1: ctrl (Tiedke scheme)
- Simulation 2: becht (Bechtold scheme)
- Simulation 3: ctrl_16 (ctrl with 16 cores, 4x4)
- Simulation 4: becht_16 (becht with 16 cores, 4x4)

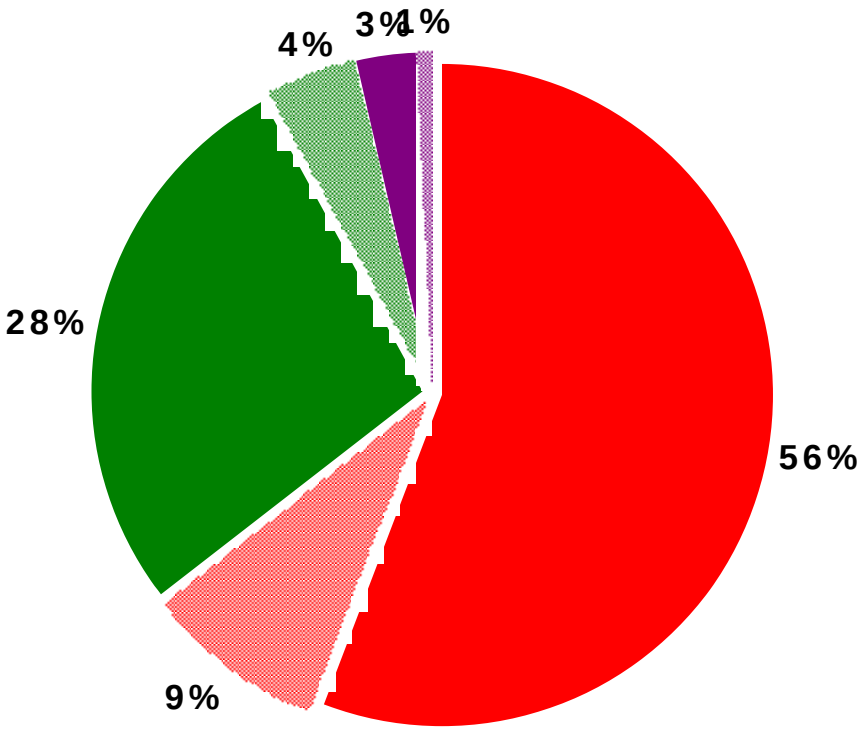
Overview of the work

&PHYCTL CTRL	&PHYCTL BECHT
lsuper_coolw=.true.,	lsuper_coolw=.true.,
itype_conv=0,	**itype_conv=2,**
lseaice=.FALSE.,	lseaice=.FALSE.,
ltkesso=.true.,	ltkesso=.true.,
lconf_avg=.false.,	lconf_avg=.false.,
nincrad=55,	nincrad=55,
itype_albedo=1,	itype_albedo=1,
icapdcycl=2,	**icapdcycl=3,**
icpl_aero_conv=0,	**icpl_aero_conv=1,**
/END	/END

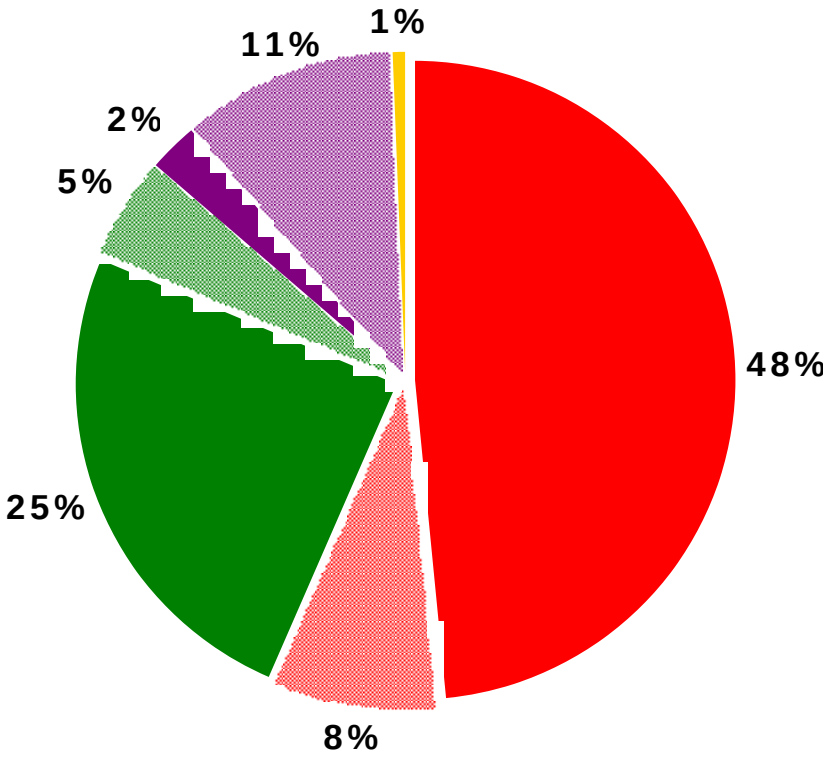
Overview of the work

&TUNING CTRL/BECHT
rlam_heat=0.1,
rat_sea=40.0,
pat_len=2000.0,
gkwake=0.8,
mu_rain=0.5,
cloud_num=5.00E+07,
crsmin=200.,
/END

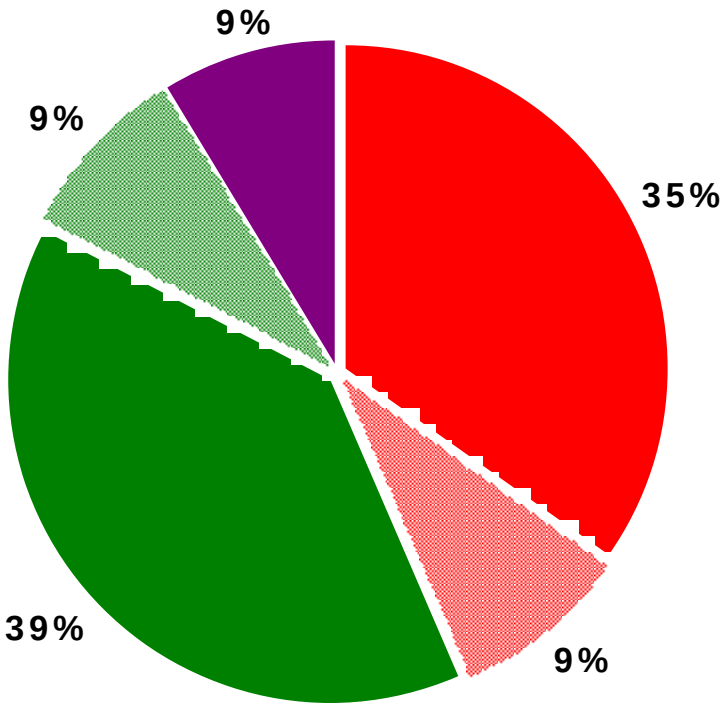
CTRL


4%
3%
1%
28%
56%
9%

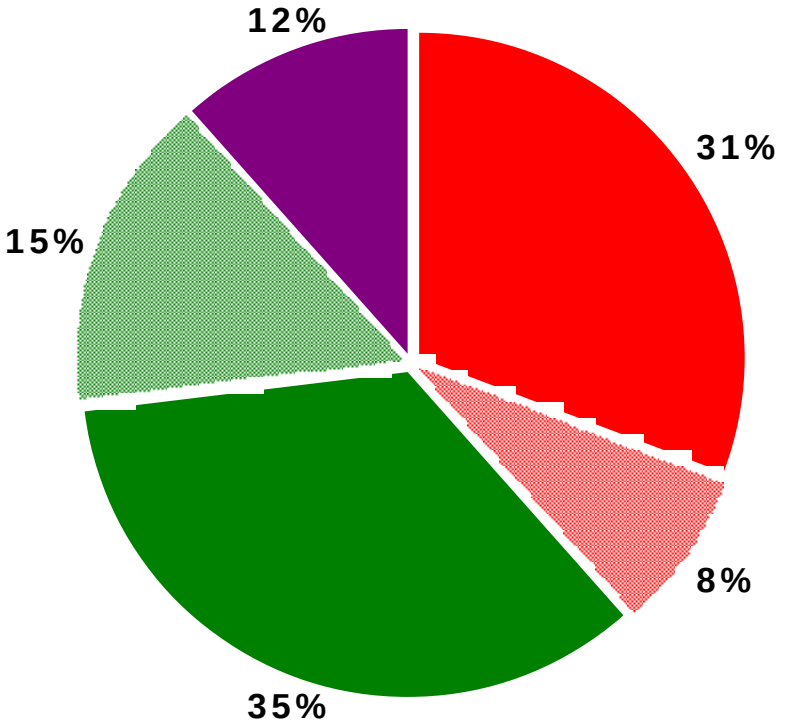
BECHT


11%
1%
2%
5%
48%
25%
8%
Dyn. Computations
Dyn. Communications
Phy. Computations
Phy. Communications
Add. Computations
Input Comput. & Read
Output Comput. & Write

CTRL



BECHT



Precipitation
Radiation
Turbulence
Convection
Soil Model

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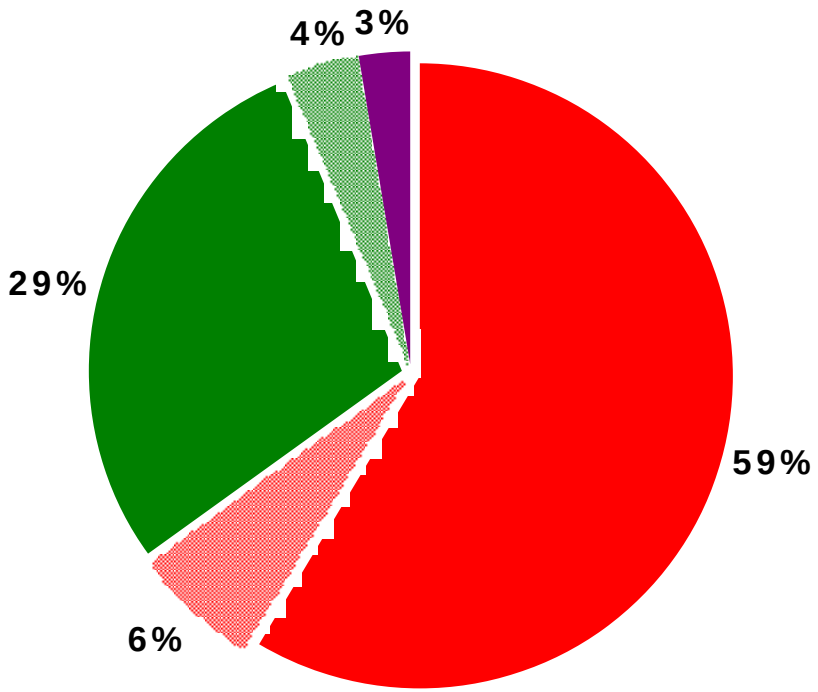
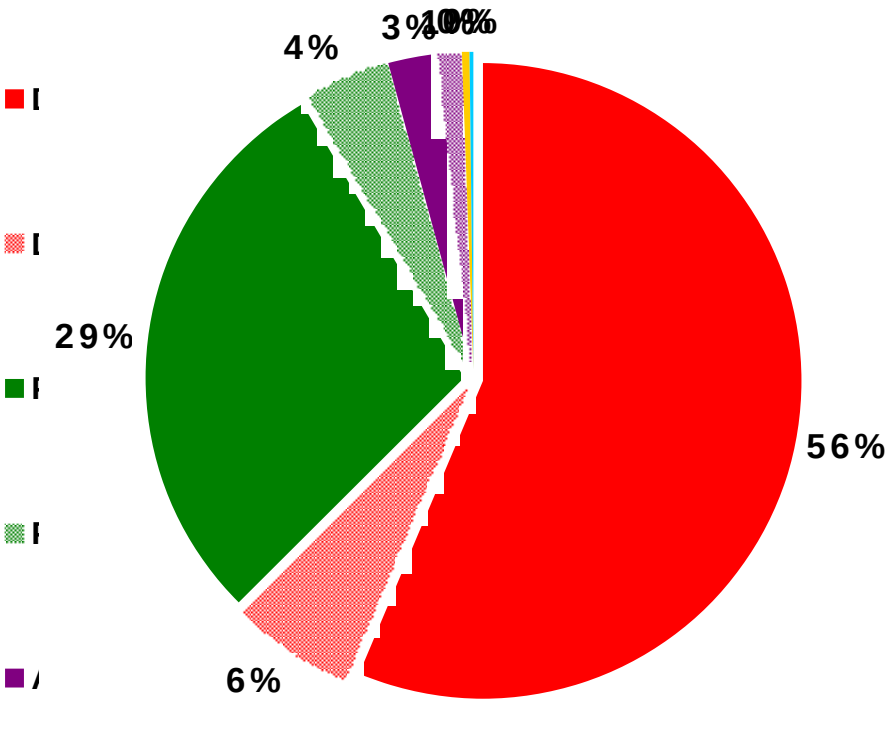
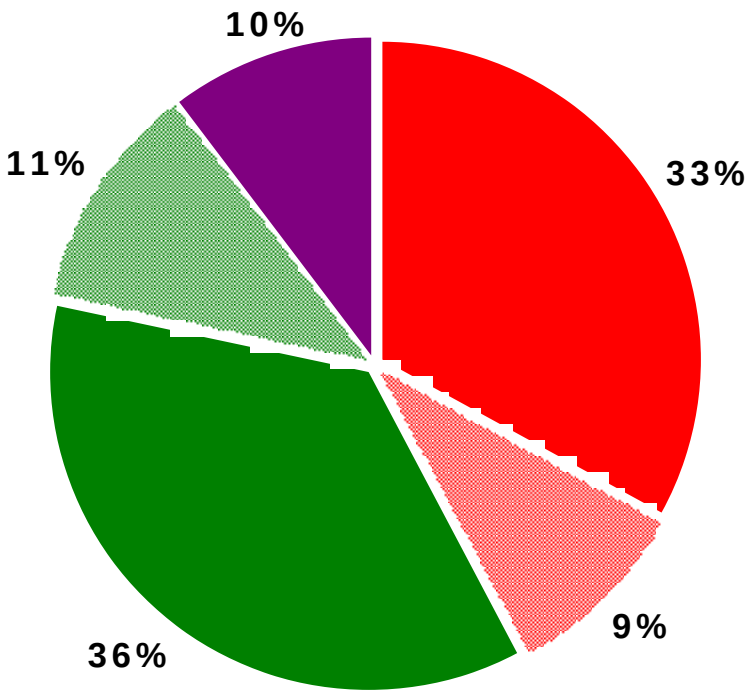
CTRL_16



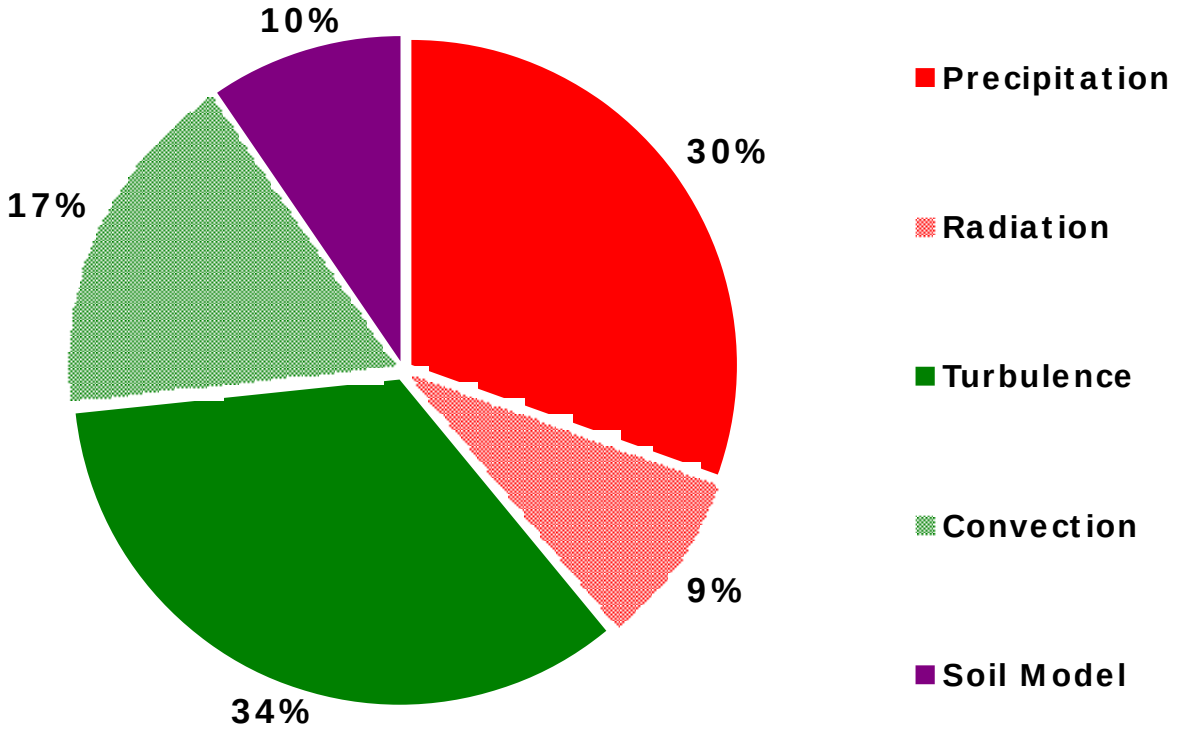
BECHT_16



CTRL_16



BECHT_16

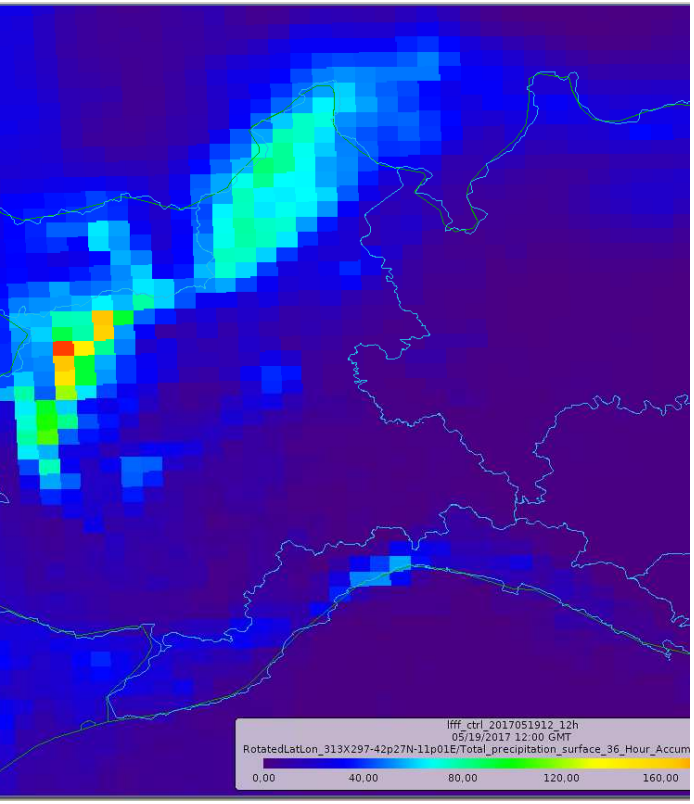


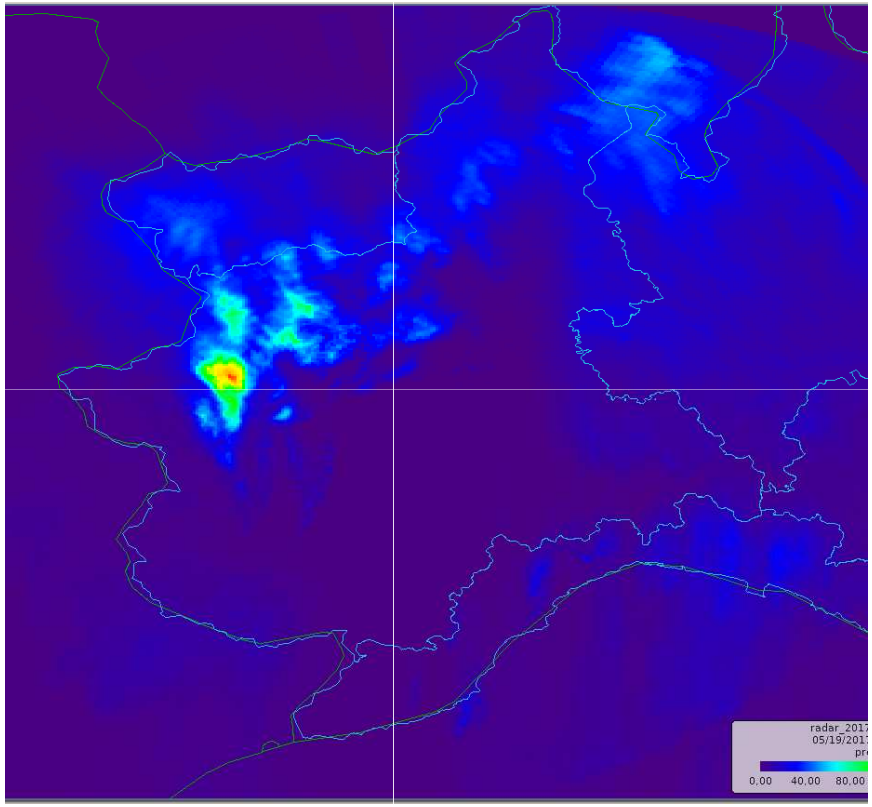
CTRL	BECHT	CTRL_16	BECHT_16
1304 s	1507 s	4636 s	4835 s

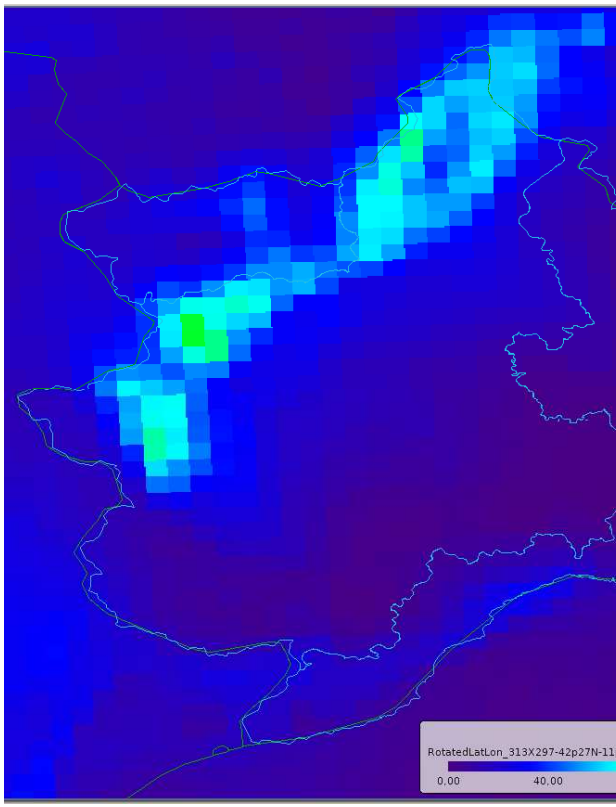
Scaling Ratio CTRL: 3.5

Scaling Ratio BECHT: 3.2

12h tot_prec, 20170519 12UTC, +36h FORECAST







CTRL **RADAR** **BECHT**

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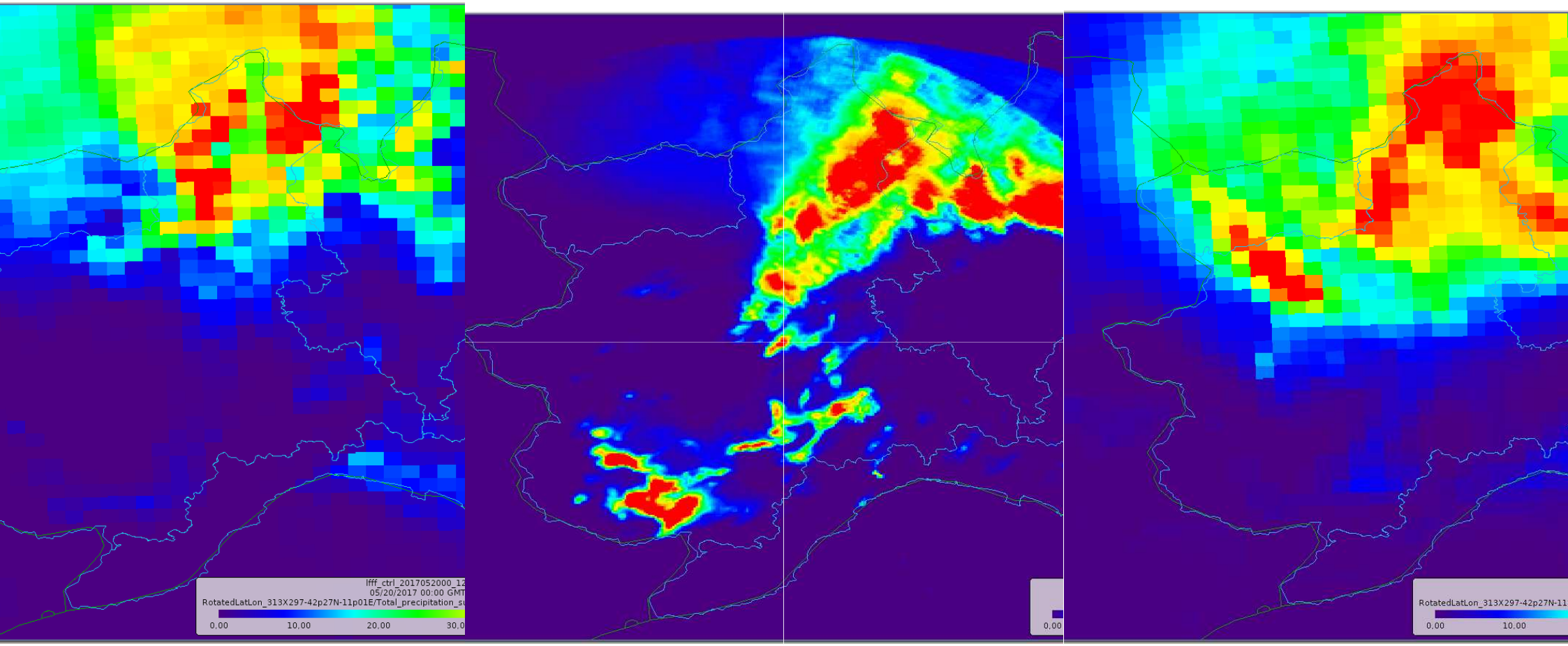

CTRL **RADAR** **BECHT**

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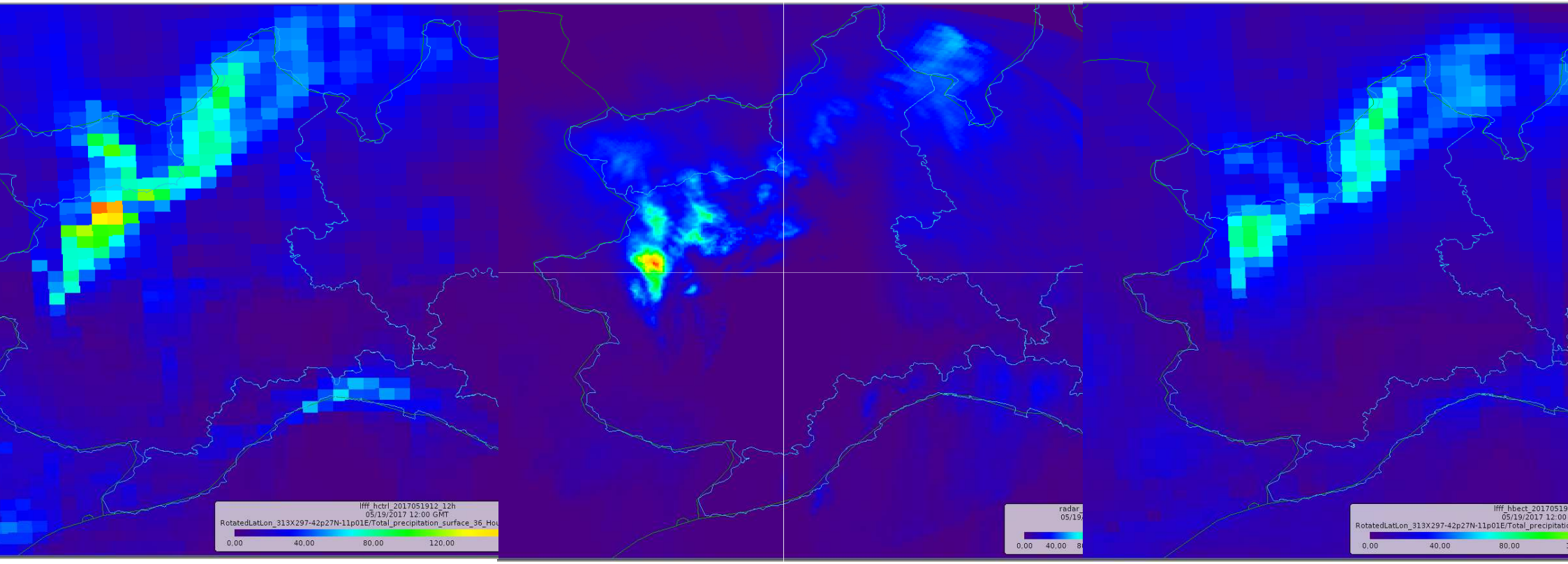
12h tot_prec, 20170519 12UTC, HINDCAST



CTRL **RADAR** **BECHT**

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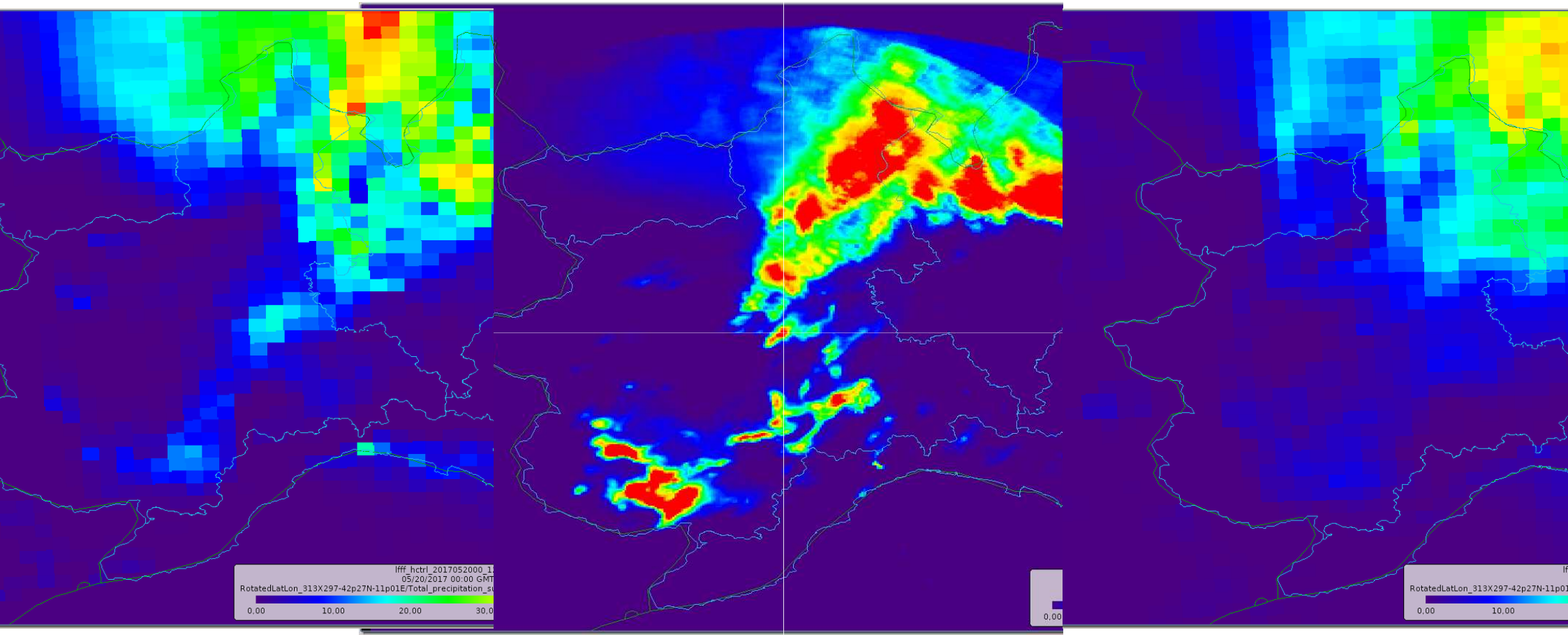
12h tot_prec, 20170520 00UTC, HINDCAST



CTRL **RADAR** **BECHT**

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Preliminary conclusions

- Computational time comparable
- Scaling comparable
- Results comparable in space, but smoothed intensity in Bechtold