P3-v5.3.12

HRDPS validation in GEM5.3.10-a10 and PA3a configuration

Note: P3v5.3.6 is in GEM530a10

v5.3.12: changes since v5.3.6

Differences

- Diag_dhmax, p3_main call, diag_3d, diag_2d in wrapper_wrf (affects only wrf)
- Qiliq initialization to 0 (affects only predicted liquid fraction LF)
- Bugfix to epsi_tot=0, epsiw_tot=0 (affects only nCat>1)
- Bugfix in qiliq rates in conservation (WRF bug) (affects only predicted LF)
- Use den_ice to update Zitot (affects only 3mom)
- Get_rain_dsd optimization (not bitmatching, but very similar)
- Limits to qcnuc to prevent negative riming (only at initiation)

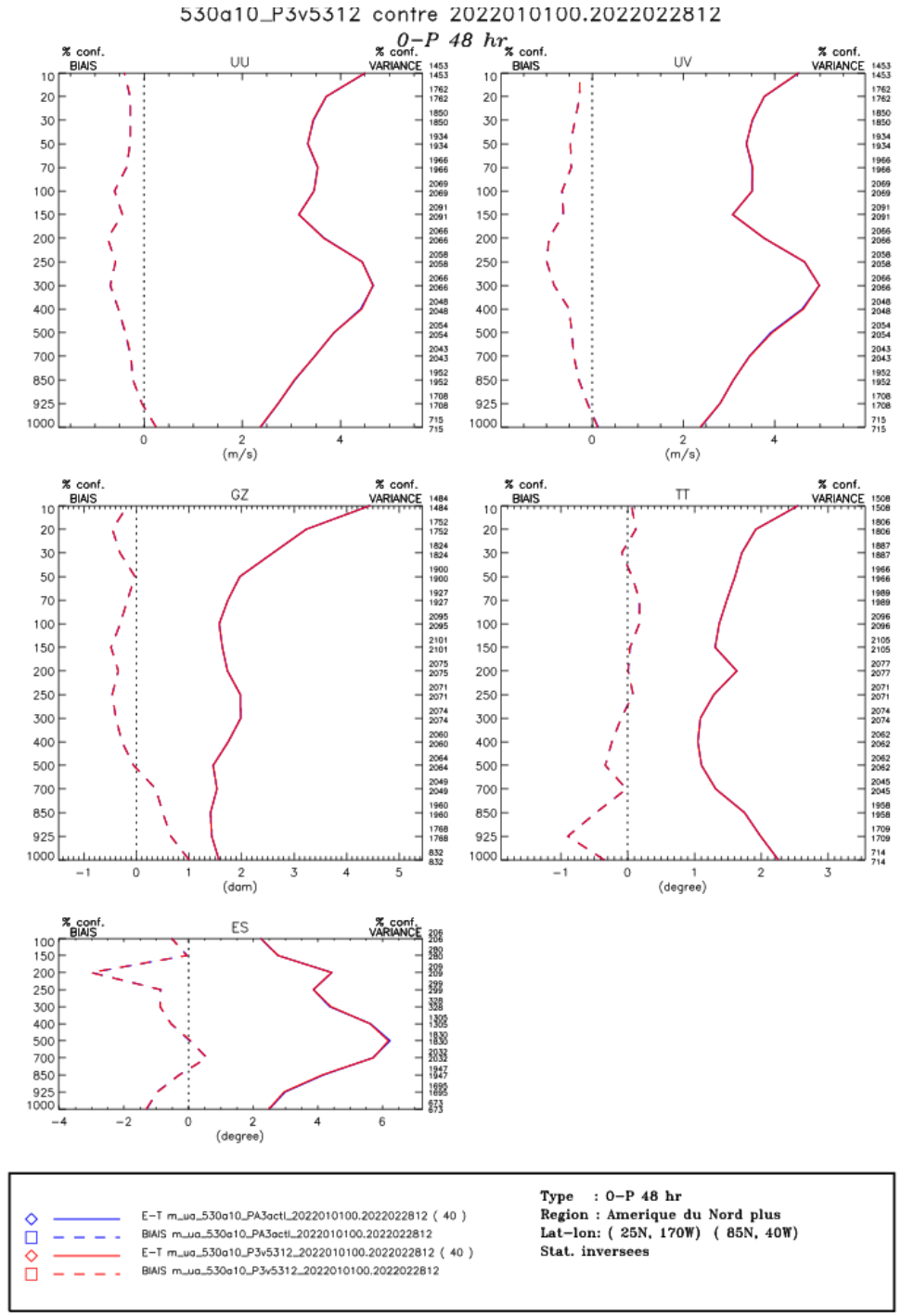
In red: will affect the solution for 2mom_noLF

In black: will not affect 2mom_noLF

Note: only winter 2022 (40 cases) is shown because changes were very small.

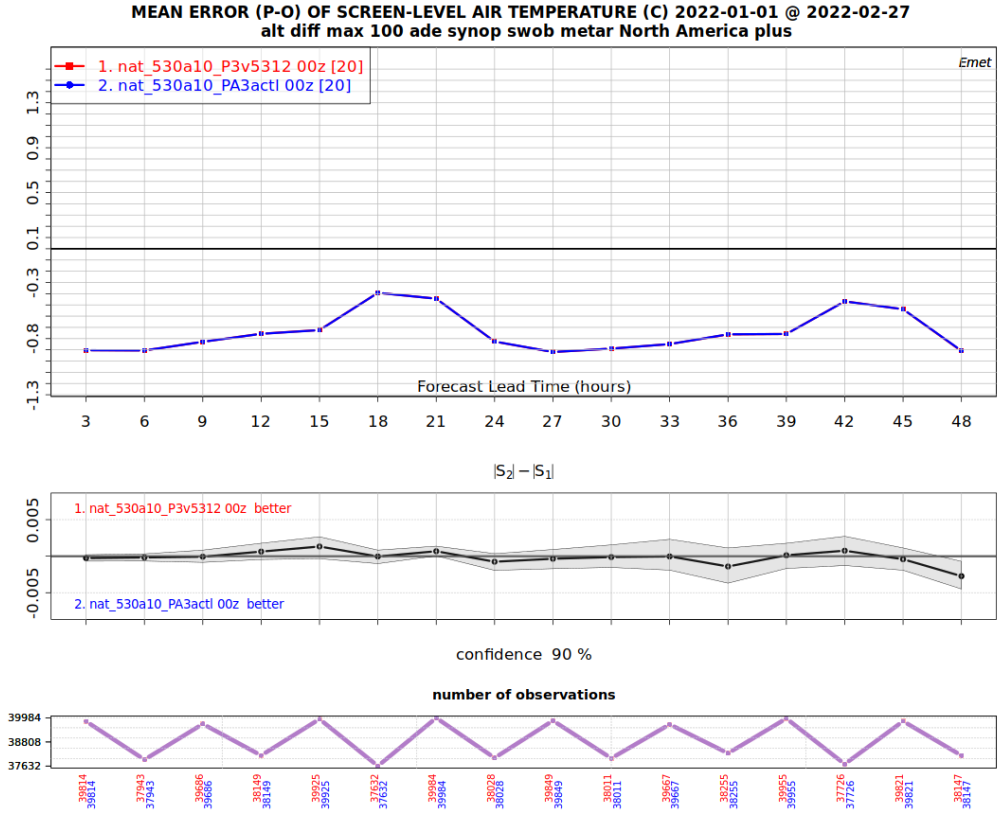
Scores v5.3.6 vs. 5.3.12

- Arcad → completely neutral



Scores v5.3.6 vs. 5.3.12

- Emet, neutral for TT, TD, P0 & UV



bias < >

SELECT * FROM score.score_file_m

bias nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z		20220101 / 20220228 All
Appalachia CLIM	TD	0.00019
	TT	-0.00042
Arctic All CLIM	TD	0.0
	TT	0.0005
Arctic Land CLIM	TD	0.001
	TT	0.00029
Boreal CLIM	TD	-0.00064
	TT	3.6e-05
Canada	TD	-2.9e-05
	TT	3.1e-05
Central CLIM	TD	0.00069
	TT	0.0
Central Plains CLIM	TD	0.0
	TT	0.0
Great Lakes CLIM	TD	0.00047
	TT	0.0
MidAtlantic CLIM	TD	0.0
	TT	0.0
Mt West CLIM	TD	0.0
	TT	-0.00051
North America plus	TD	0.0
	TT	-0.00013
North Atlantic CLIM	TD	-0.0005
	TT	-0.00018
North Plains CLIM	TD	0.00022
	TT	-0.0001
Pacific North West CLIM	TD	-0.00085
	TT	0.0
Prairie CLIM	TD	0.0
	TT	-7.1e-05

rmse < >

SELECT * FROM score.score_file_me

rmse nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z		20220101 / 20220228 All
Appalachia CLIM	TD	0.0
	TT	-0.00031
Arctic All CLIM	TD	-0.00065
	TT	-0.00053
Arctic Land CLIM	TD	-0.00058
	TT	-0.00033
Boreal CLIM	TD	0.00011
	TT	8e-05
Canada	TD	-0.00024
	TT	-5.1e-05
Central CLIM	TD	0.00054
	TT	0.0
Central Plains CLIM	TD	0.0
	TT	0.0
Great Lakes CLIM	TD	0.00028
	TT	0.00034
MidAtlantic CLIM	TD	0.0
	TT	-0.00043
Mt West CLIM	TD	0.00043
	TT	0.0
North America plus	TD	0.00023
	TT	3.7e-05
North Atlantic CLIM	TD	0.0
	TT	0.0
North Plains CLIM	TD	7e-05
	TT	5.4e-05
Pacific North West CLIM	TD	-0.00061
	TT	0.0
Prairie CLIM	TD	0.0
	TT	0.0

stdev < >

SELECT * FROM score.score_file_m

stdev nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z		20220101 / 20220228 All
Appalachia CLIM	TD	0.0
	TT	-0.00051
Arctic All CLIM	TD	-0.00065
	TT	-0.00057
Arctic Land CLIM	TD	-0.00058
	TT	-0.00068
Boreal CLIM	TD	0.00061
	TT	0.00025
Canada	TD	-0.00054
	TT	-5.3e-05
Central CLIM	TD	0.00025
	TT	7.6e-05
Central Plains CLIM	TD	0.0
	TT	0.0
Great Lakes CLIM	TD	-1.1e-05
	TT	0.00038
MidAtlantic CLIM	TD	0.0
	TT	-0.00049
Mt West CLIM	TD	0.00024
	TT	-0.00054
North America plus	TD	0.00023
	TT	7.2e-05
North Atlantic CLIM	TD	0.0
	TT	0.0
North Plains CLIM	TD	6.8e-05
	TT	0.00039
Pacific North West CLIM	TD	-0.00064
	TT	-0.00014
Prairie CLIM	TD	0.0
	TT	0.0

bias < >

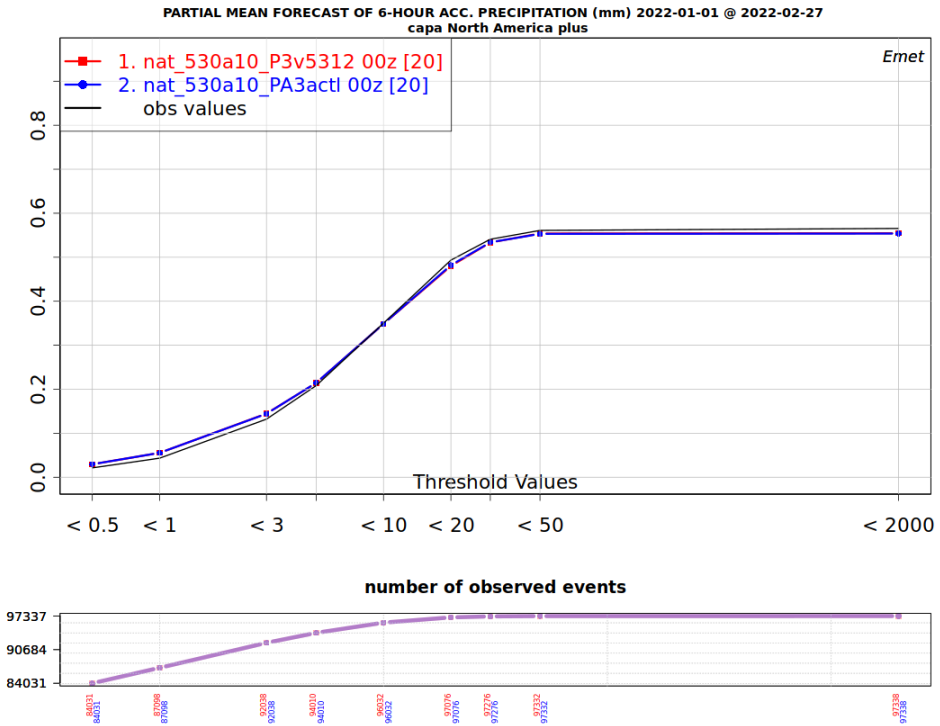
bias nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z	20220101 / 20220228 All
Appalachia CLIM	UV 0.00057
Arctic All CLIM	UV -0.00075
Arctic Land CLIM	UV 0.0
Boreal CLIM	UV 0.0
Canada	UV -7.9e-05
Central CLIM	UV 0.0
Central Plains CLIM	UV 0.00092
Great Lakes CLIM	UV 0.0
MidAtlantic CLIM	UV 0.0
Mt West CLIM	UV 0.00097
North America plus	UV -0.00035
North Atlantic CLIM	UV -0.0018
North Plains CLIM	UV -0.00028
Pacific North West CLIM	UV 0.0
Prairie CLIM	UV 0.0

bias < >

bias nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z	20220101 / 20220228 All
Appalachia CLIM	P0 0.00041
Arctic All CLIM	P0 0.00027
Arctic Land CLIM	P0 0.0
Boreal CLIM	P0 0.0003
Canada	P0 0.0
Central CLIM	P0 0.00022
Central Plains CLIM	P0 0.0021
Great Lakes CLIM	P0 -0.00042
MidAtlantic CLIM	P0 0.0
Mt West CLIM	P0 -0.00044
North America plus	P0 0.0
North Atlantic CLIM	P0 0.00013
North Plains CLIM	P0 0.00046
Pacific North West CLIM	P0 4e-05
Prairie CLIM	P0 0.0

Scores v5.3.6 vs. 5.3.12

- Emet PR6, PR24 → neutral



ets < >

SELECT * FROM score.score_file_m

ets nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z		20220101 / 20220228 All
Appalachia CLIM	PR24	0.0015
	PR6	0.0
Arctic All CLIM	PR24	0.0041
	PR6	0.0
Arctic Land CLIM	PR24	0.0
	PR6	0.0
Boreal CLIM	PR24	0.013
	PR6	0.013
Canada	PR24	-0.0038
	PR6	-0.0015
Central CLIM	PR24	0.0038
	PR6	-0.0023
Central Plains CLIM	PR24	0.0
	PR6	0.0
Great Lakes CLIM	PR24	0.0
	PR6	0.0054
MidAtlantic CLIM	PR24	-0.0023
	PR6	0.0019
Mt West CLIM	PR24	0.0
	PR6	0.0
North America plus	PR24	0.0
	PR6	0.0027
North Atlantic CLIM	PR24	-0.0038
	PR6	-0.0037
North Plains CLIM	PR24	0.0
	PR6	0.0
Pacific North West CLIM	PR24	-0.0019
	PR6	0.0
Prairie CLIM	PR24	0.0048
	PR6	-0.00058

fbi < >

SELECT * FROM score.score_file_me

fbi nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z		20220101 / 20220228 All
Appalachia CLIM	PR24	0.0079
	PR6	0.0076
Arctic All CLIM	PR24	0.0
	PR6	0.0026
Arctic Land CLIM	PR24	0.0
	PR6	-0.017
Boreal CLIM	PR24	0.0
	PR6	0.015
Canada	PR24	-0.011
	PR6	0.0019
Central CLIM	PR24	-0.0019
	PR6	0.0
Central Plains CLIM	PR24	0.0
	PR6	0.0
Great Lakes CLIM	PR24	0.0
	PR6	0.0052
MidAtlantic CLIM	PR24	0.029
	PR6	0.0061
Mt West CLIM	PR24	0.024
	PR6	0.0
North America plus	PR24	0.0017
	PR6	0.0027
North Atlantic CLIM	PR24	-0.00098
	PR6	0.012
North Plains CLIM	PR24	0.0
	PR6	0.0
Pacific North West CLIM	PR24	0.0045
	PR6	0.0
Prairie CLIM	PR24	-0.0045
	PR6	0.0

far < >

SELECT * FROM score.score_file_me

far nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z		20220101 / 20220228 All
Appalachia CLIM	PR24	-1.5e-05
	PR6	0.0012
Arctic All CLIM	PR24	0.0
	PR6	0.0009
Arctic Land CLIM	PR24	0.0
	PR6	0.0
Boreal CLIM	PR24	0.0089
	PR6	0.0021
Canada	PR24	-0.0055
	PR6	0.0
Central CLIM	PR24	0.076
	PR6	-0.0052
Central Plains CLIM	PR24	0.0
	PR6	0.0
Great Lakes CLIM	PR24	0.0
	PR6	0.0052
MidAtlantic CLIM	PR24	0.022
	PR6	-0.0019
Mt West CLIM	PR24	0.0
	PR6	0.0
North America plus	PR24	-0.0017
	PR6	0.0018
North Atlantic CLIM	PR24	-0.0046
	PR6	-0.0066
North Plains CLIM	PR24	0.0
	PR6	0.0
Pacific North West CLIM	PR24	0.0
	PR6	0.0
Prairie CLIM	PR24	0.072
	PR6	-0.0061

pod < >

SELECT * FROM score.score_file_m

pod nat_530a10_P3v5312 00z / nat_530a10_PA3actl 00z		20220101 / 20220228 All
Appalachia CLIM	PR24	0.0059
	PR6	0.0
Arctic All CLIM	PR24	0.0
	PR6	0.0
Arctic Land CLIM	PR24	0.0
	PR6	0.0
Boreal CLIM	PR24	0.019
	PR6	0.011
Canada	PR24	0.00083
	PR6	0.0011
Central CLIM	PR24	0.0
	PR6	0.0
Central Plains CLIM	PR24	0.0
	PR6	0.0
Great Lakes CLIM	PR24	0.0
	PR6	0.0032
MidAtlantic CLIM	PR24	-0.00055
	PR6	0.0033
Mt West CLIM	PR24	0.0
	PR6	0.0
North America plus	PR24	0.0
	PR6	0.0046
North Atlantic CLIM	PR24	-0.00045
	PR6	-0.0049
North Plains CLIM	PR24	0.0
	PR6	0.0
Pacific North West CLIM	PR24	-0.0023
	PR6	0.0031
Prairie CLIM	PR24	0.0052
	PR6	0.0017