

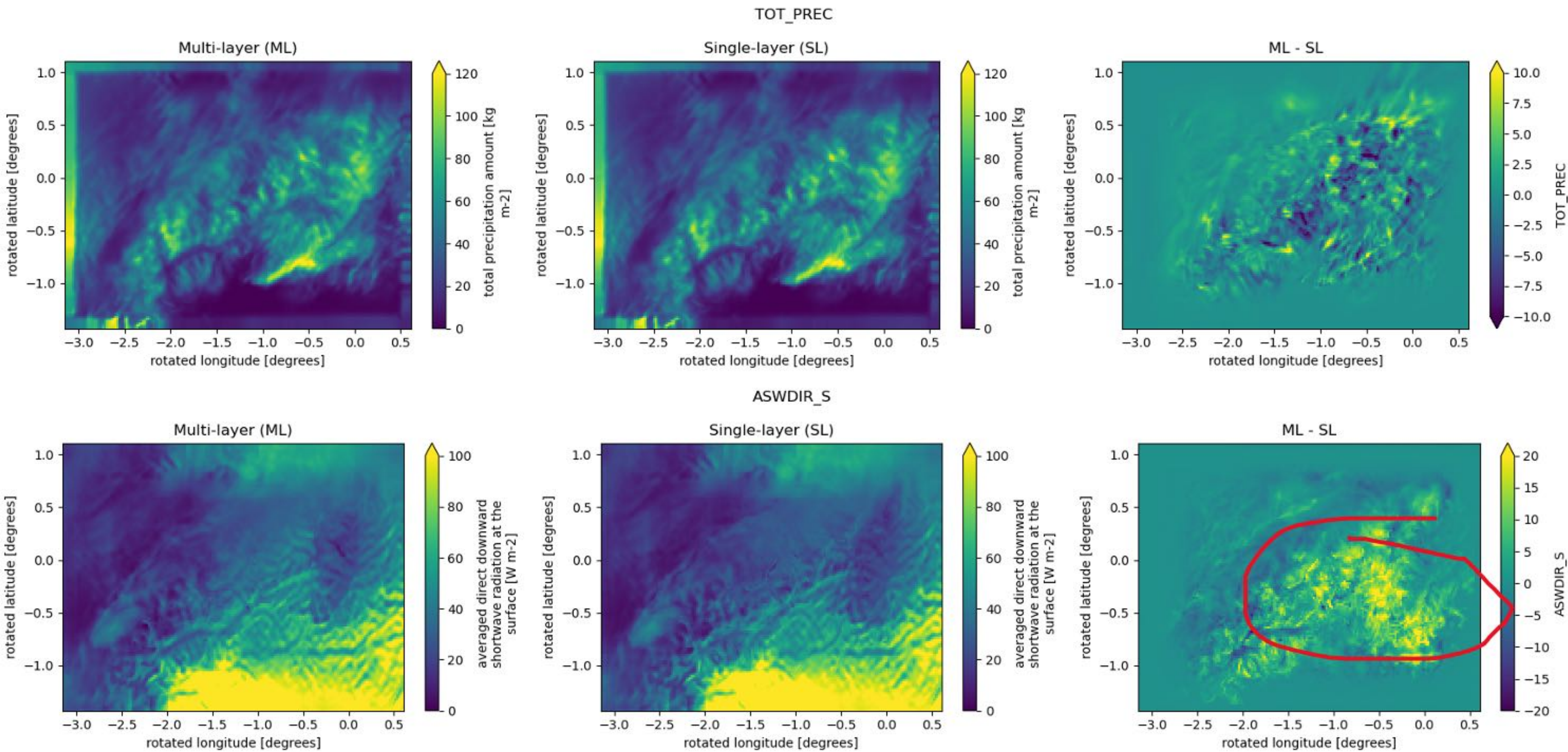
adopting snowpolino @ MCH

Progress since ICCARUS

VS, SB - September 2022

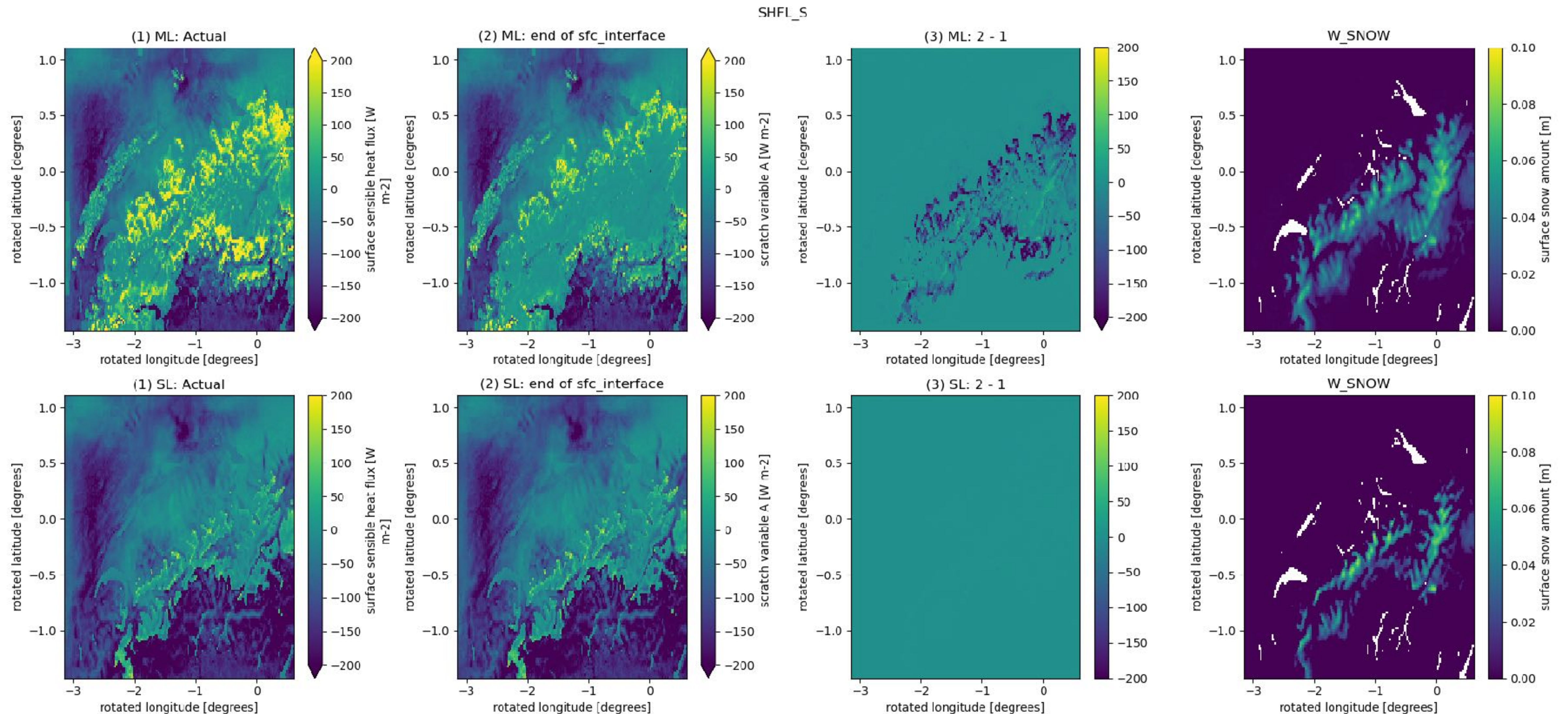
@ ICCARUS : bugs !

Significant feedback loops being triggered: major long-range perturbations induced



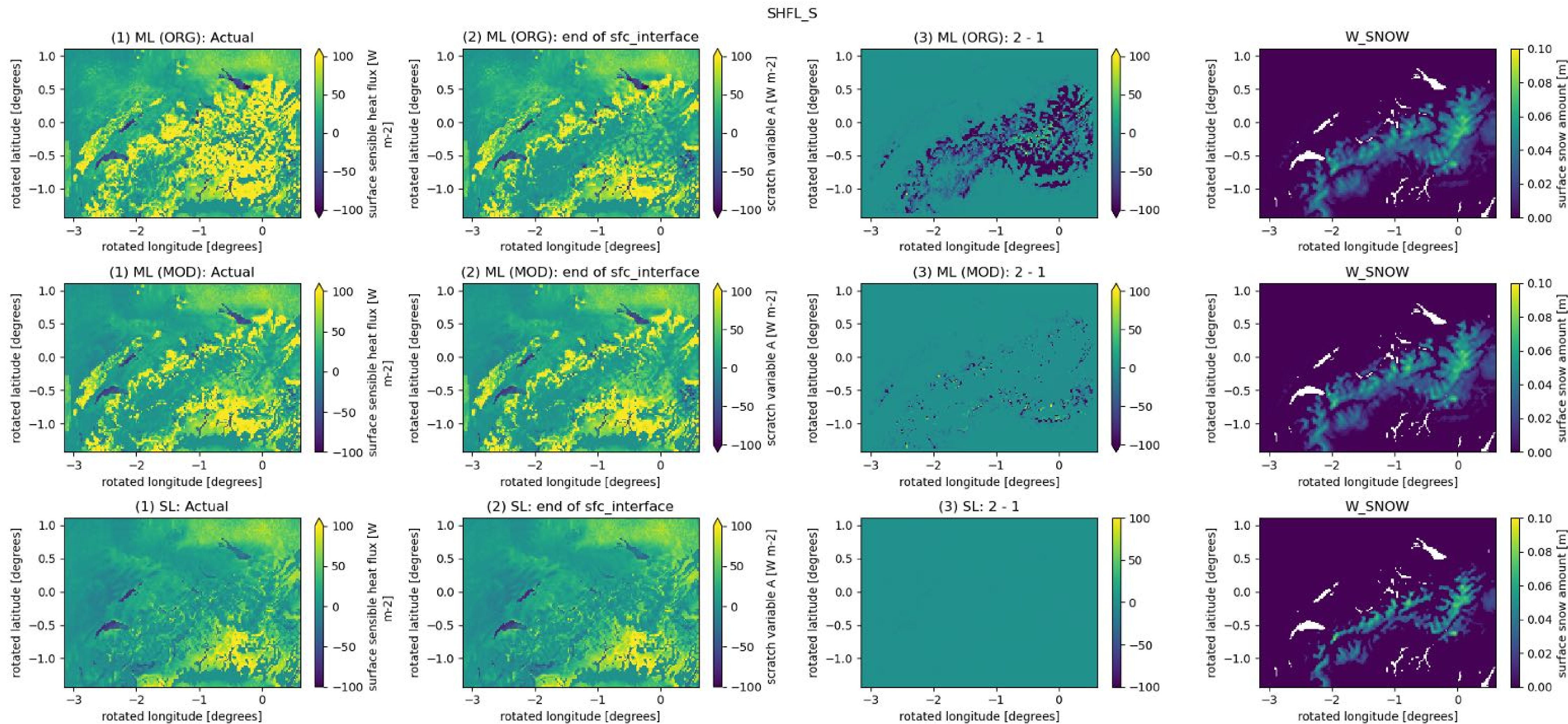
Source of bugs !

COSMO re-computes fluxes in turb* routines - overwriting fluxes 'correct' fluxes computed by SP



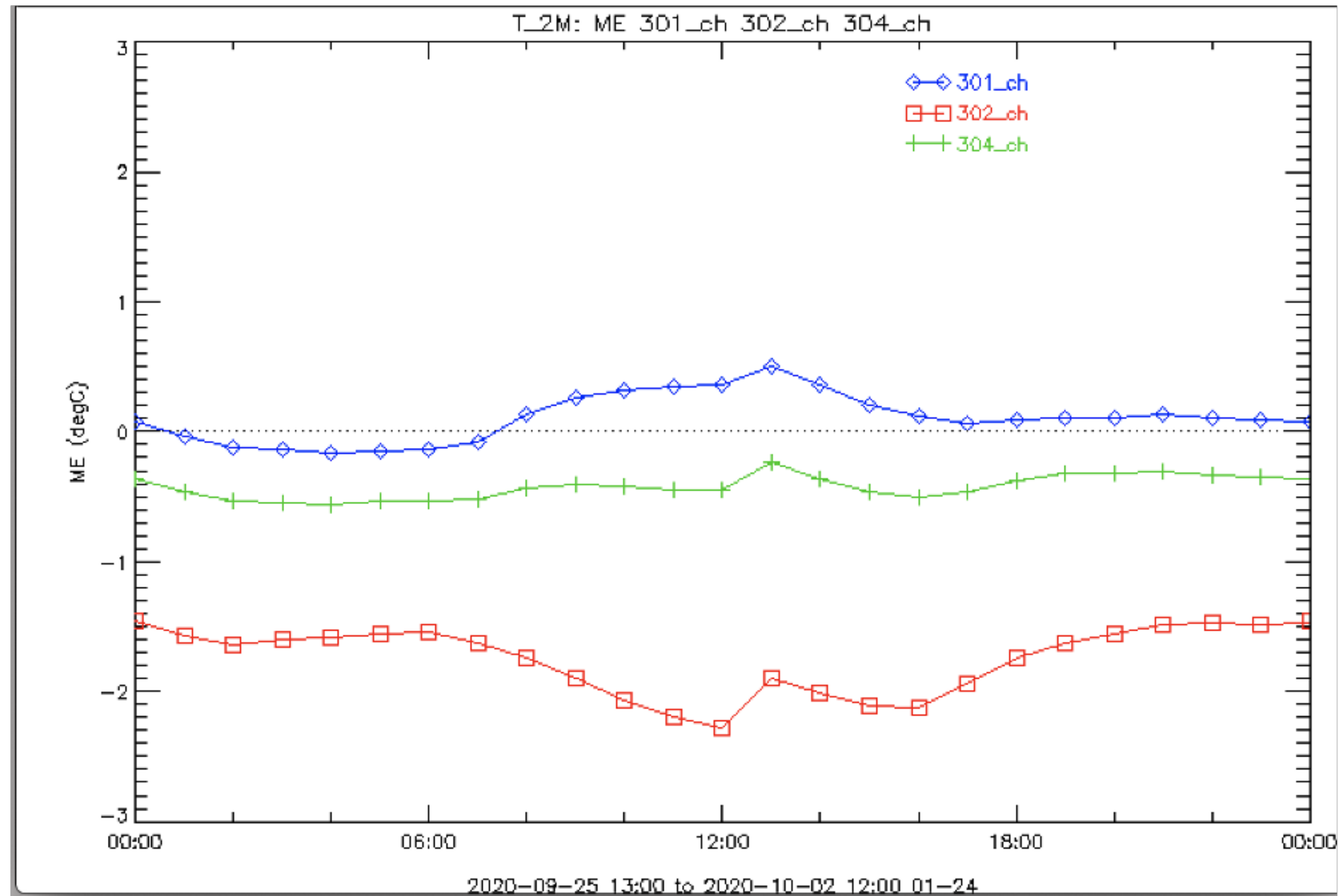
Solving the bugs - I

Best and easiest fix: replace TCH - took care of most of the differences.

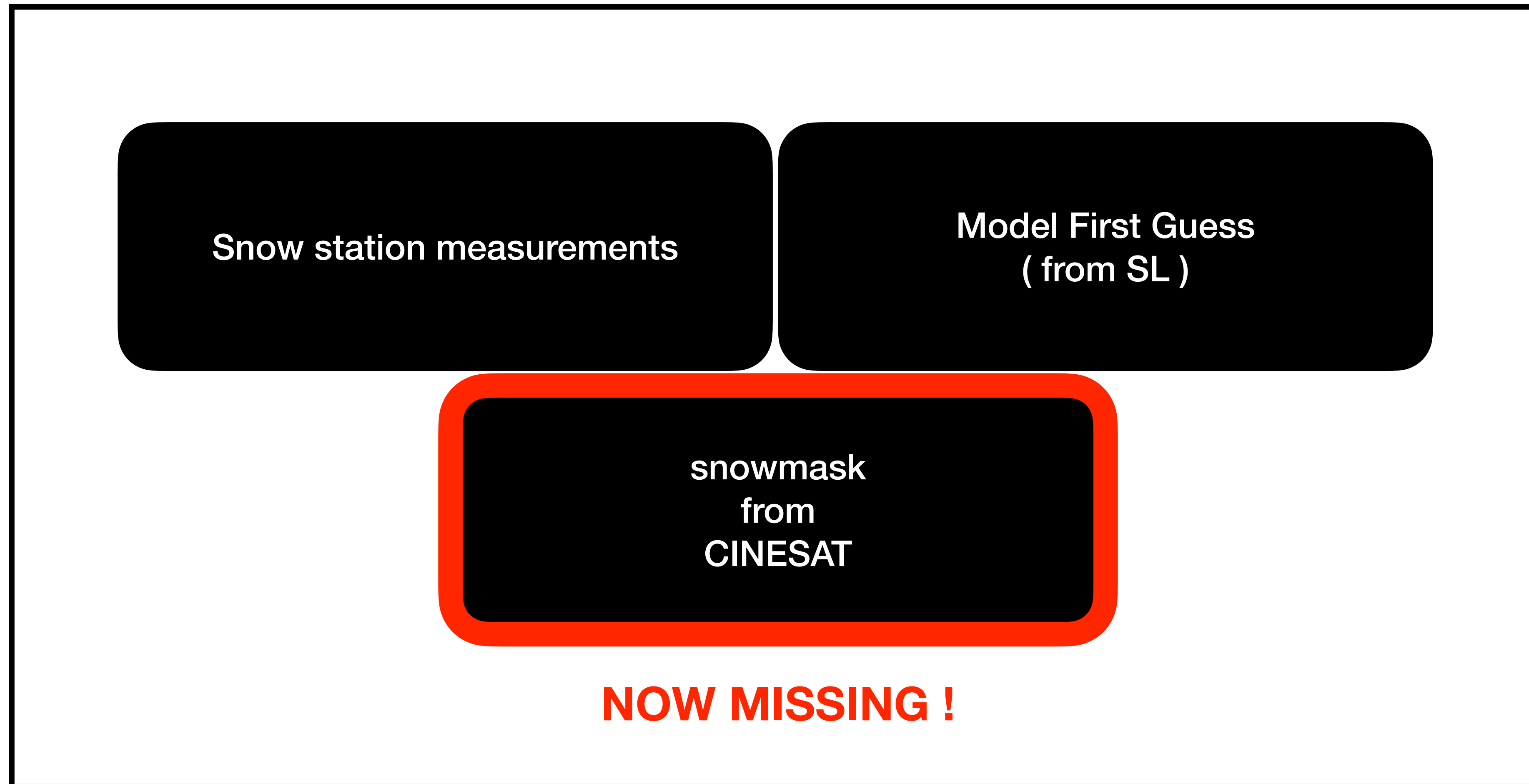


Solving the bugs - II

Second fix: replace TCH only where $fr_snow \sim 1.0$ / fallback on SL for $fr_snow < 1.0$

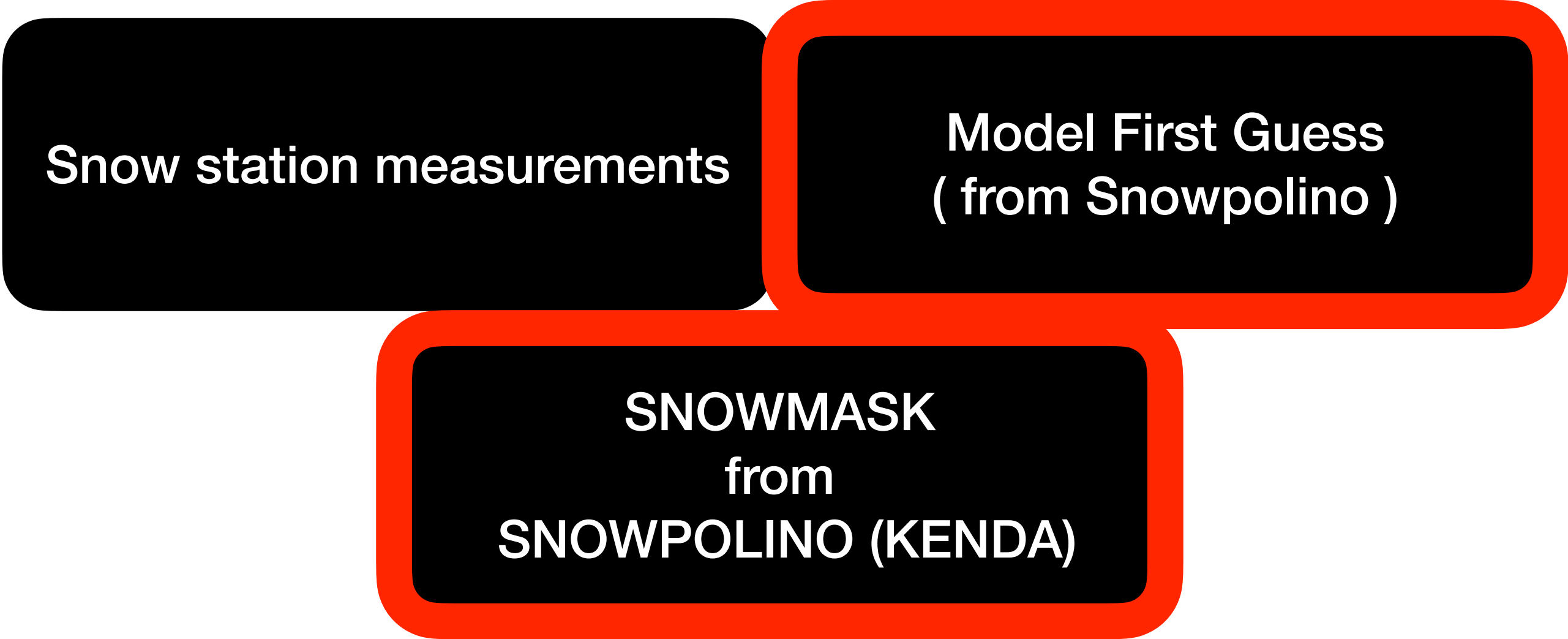


Everything 'snow' @ Meteoswiss Operational Forecasting

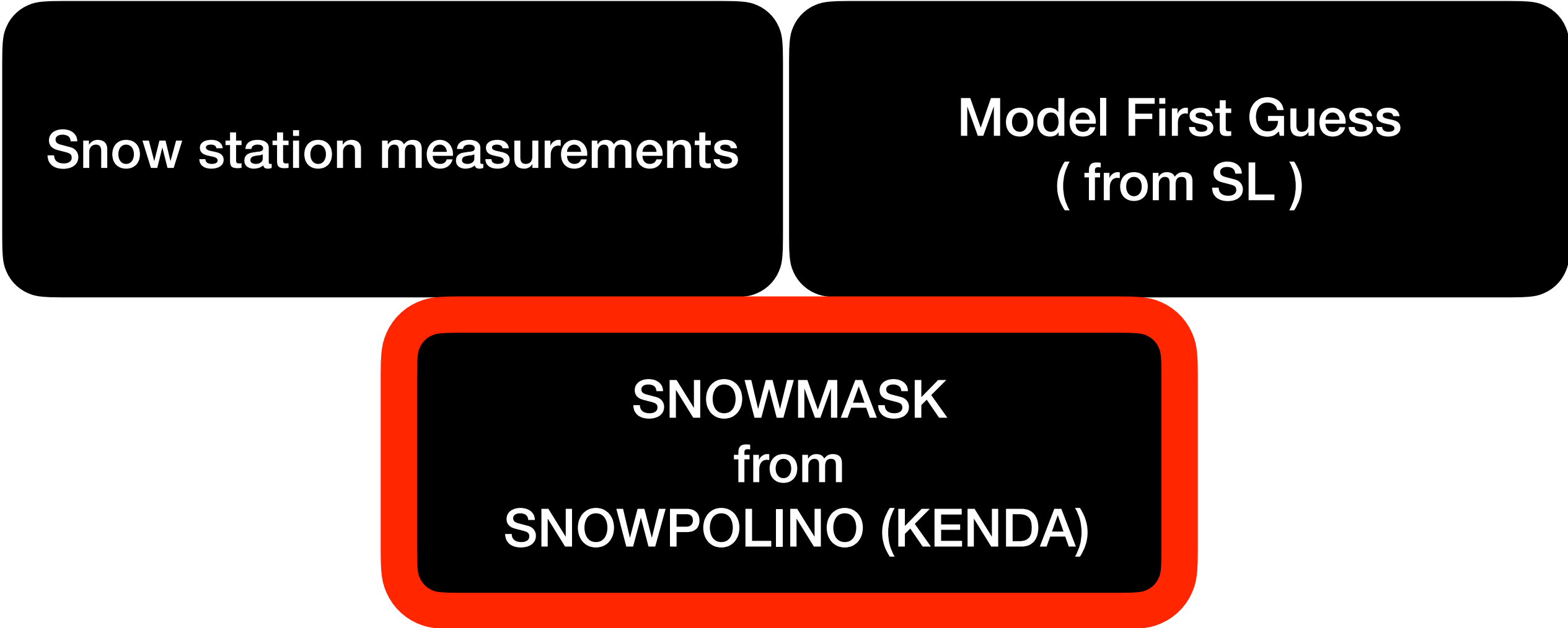


SNOW ANALYSIS

Two options for upgrading snow treatment for MCH OPR



PLAN A



PLAN B

**Snow Analysis -
necessary to solve**

PLAN B: SNOWPOLINO for snowmask

Run snowpolino in one member of KENDA-1 cycle.

- prepare new snow mask (thanks JM / DL)

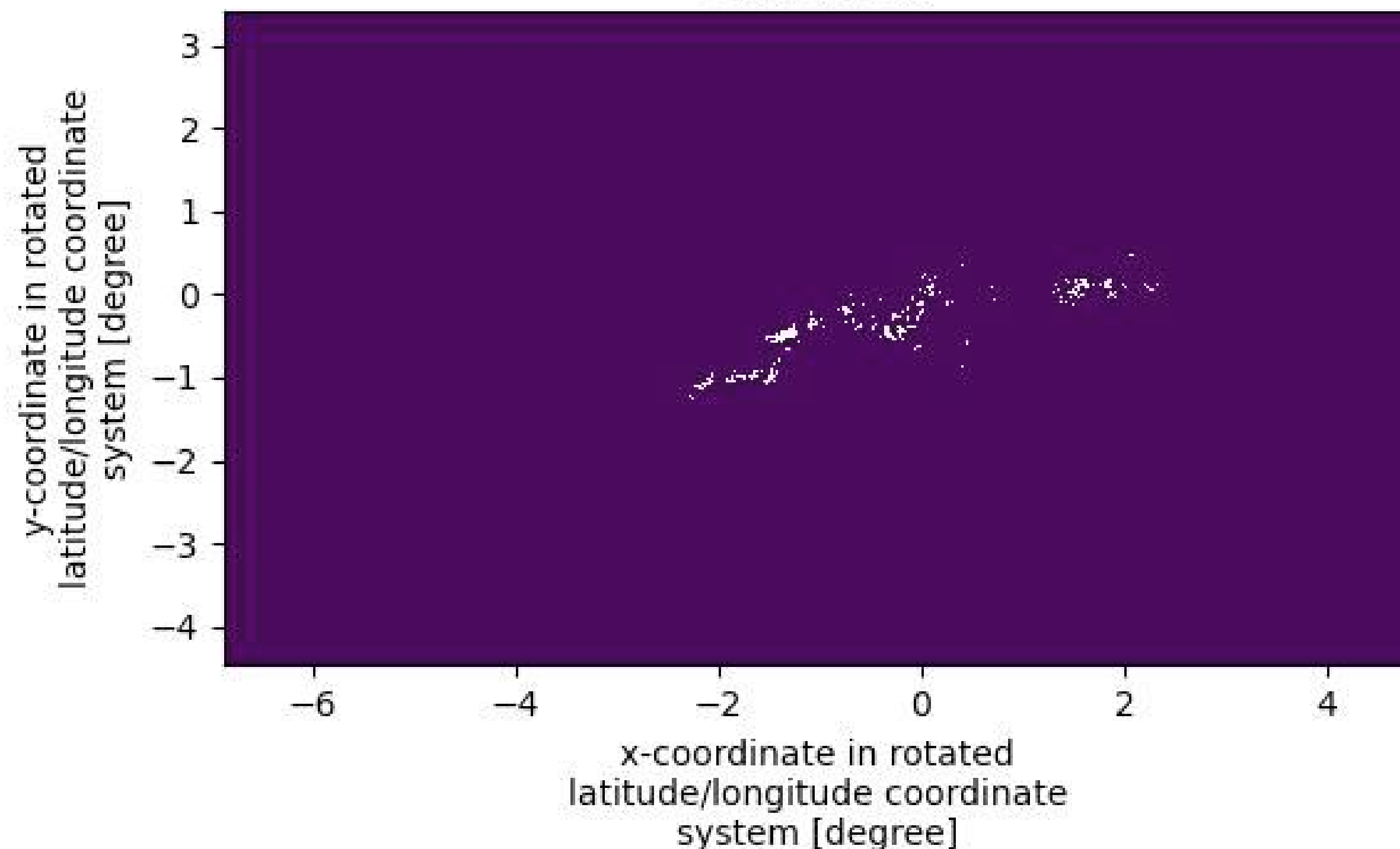
Snow station
measurements

Model First Guess
(from SL)

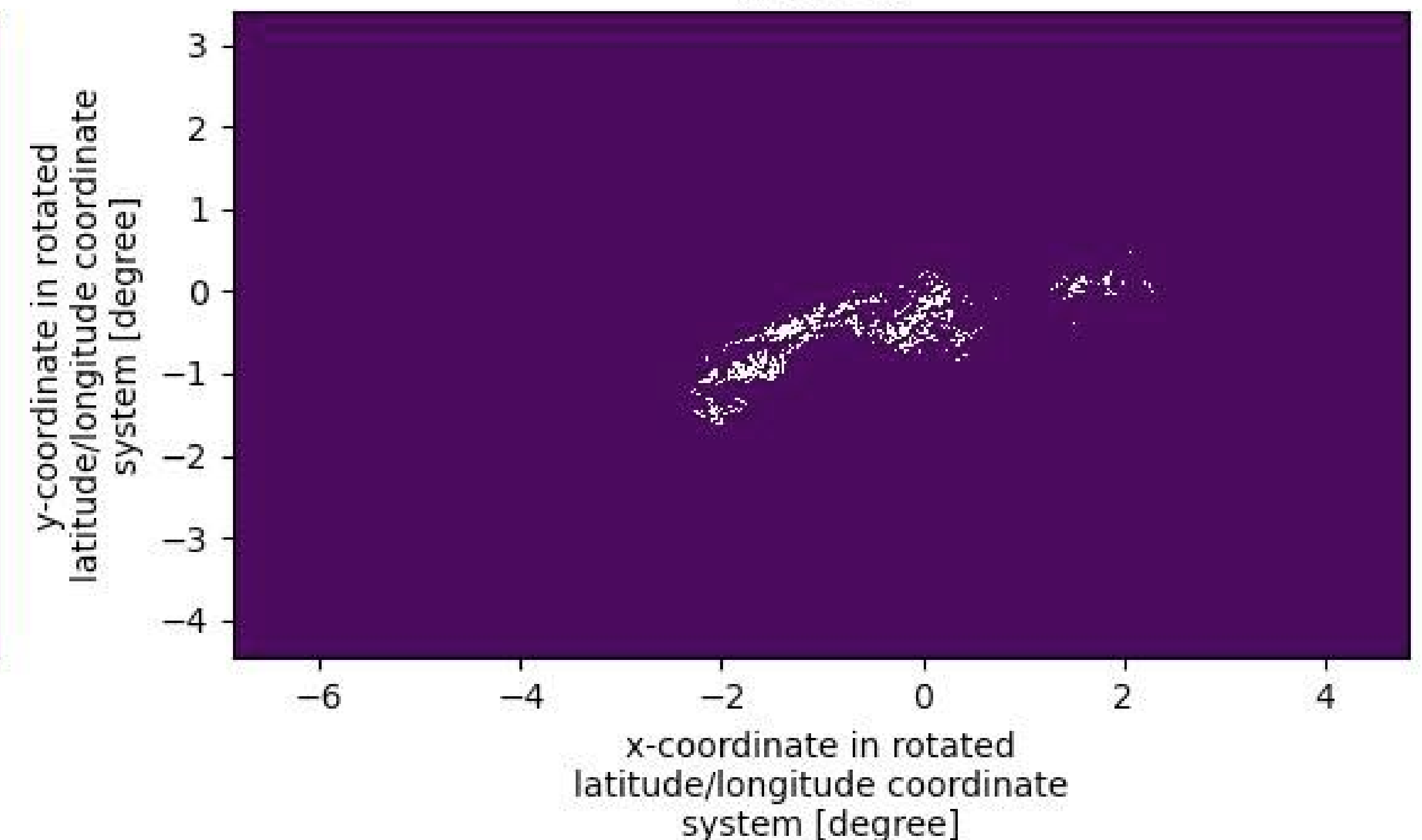
SNOWMASK
from
SNOWPOLINO

2021091711

Current SA



NEW SA



PLAN B: SNOWPOLINO for snowmask

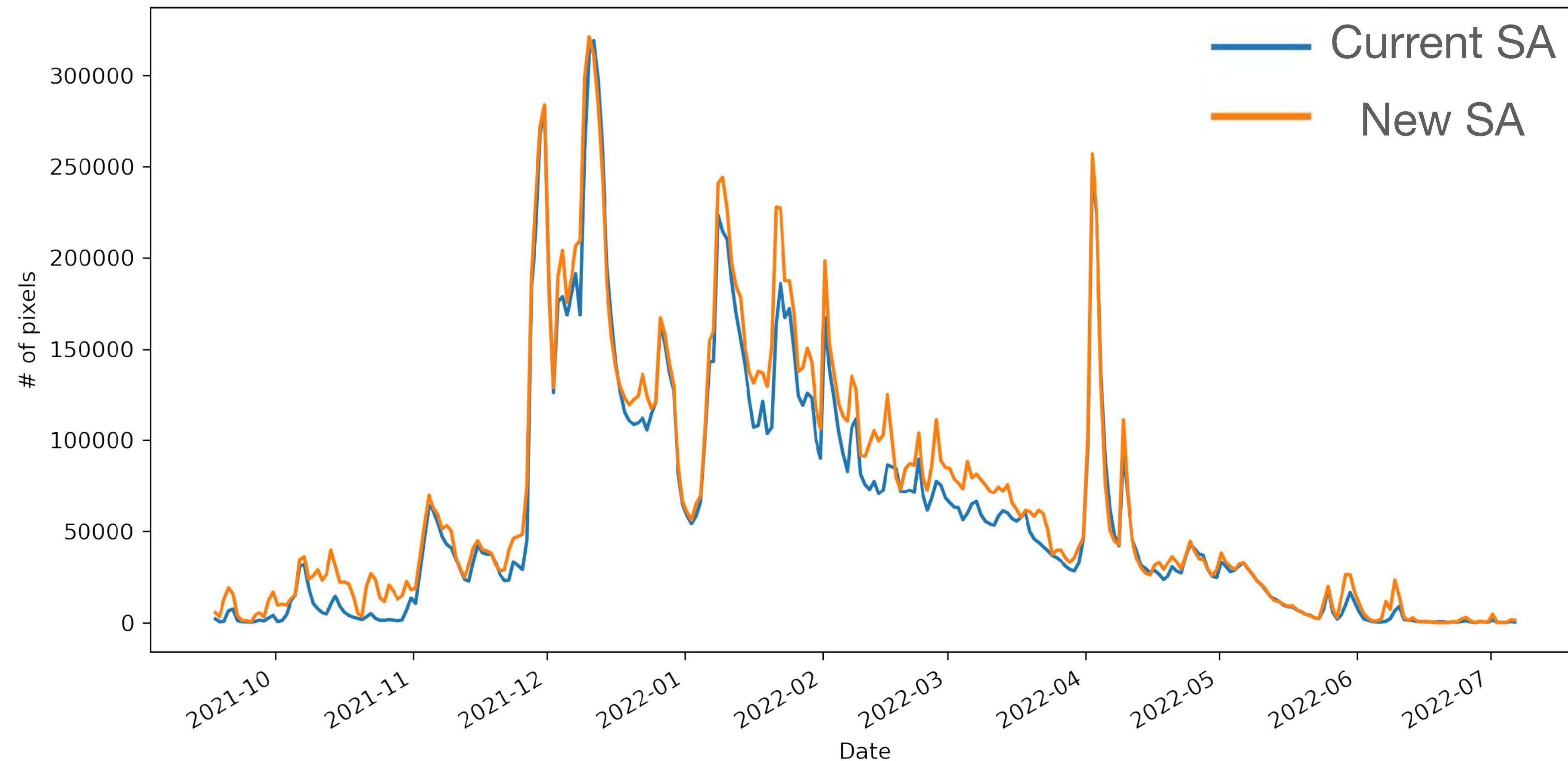
Run snowpolino in one member of KENDA-1 cycle.

- prepare new snow mask (thanks JM / DL)

Snow station
measurements

Model First Guess
(from SL)

SNOWMASK
from
SNOWPOLINO

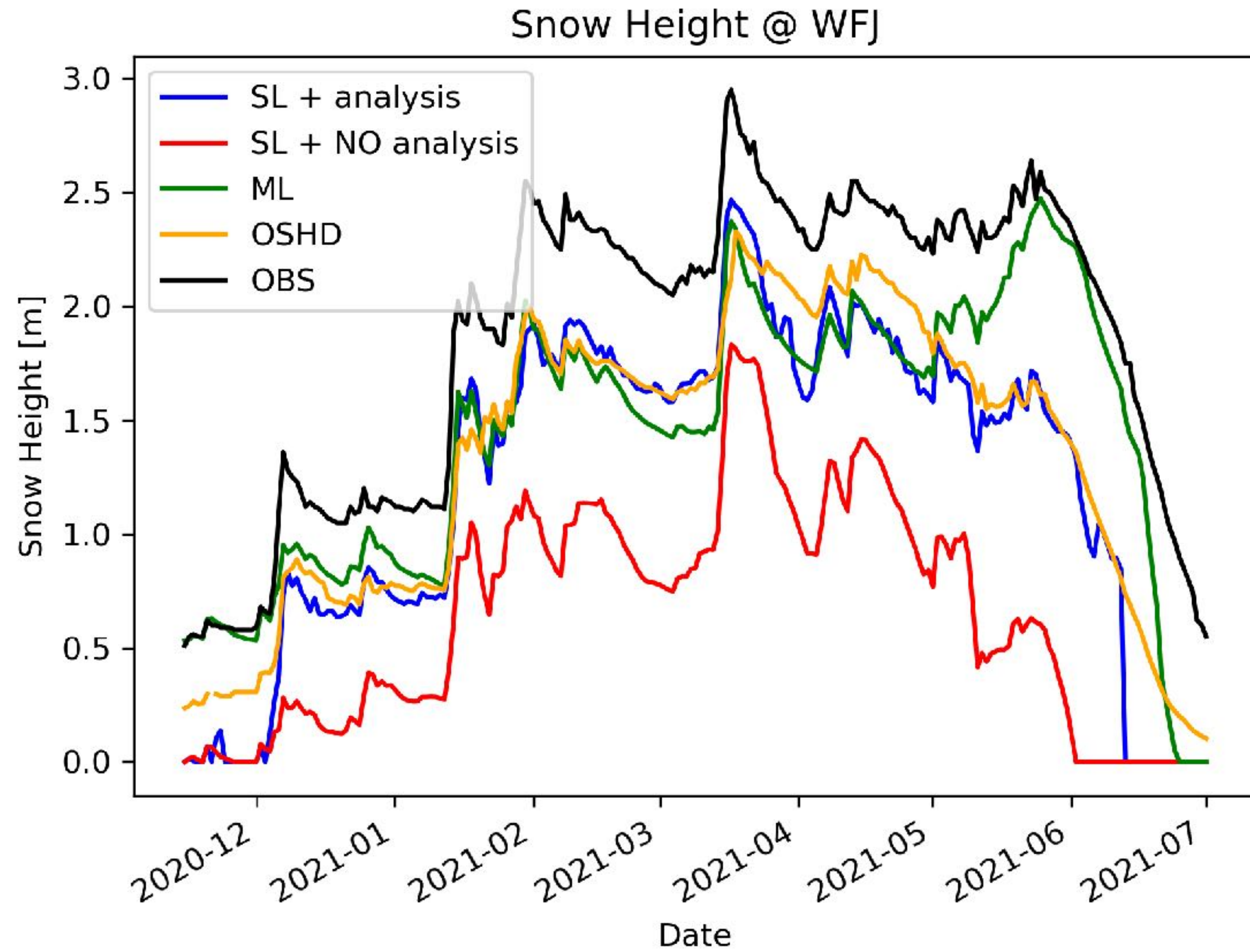


What's next

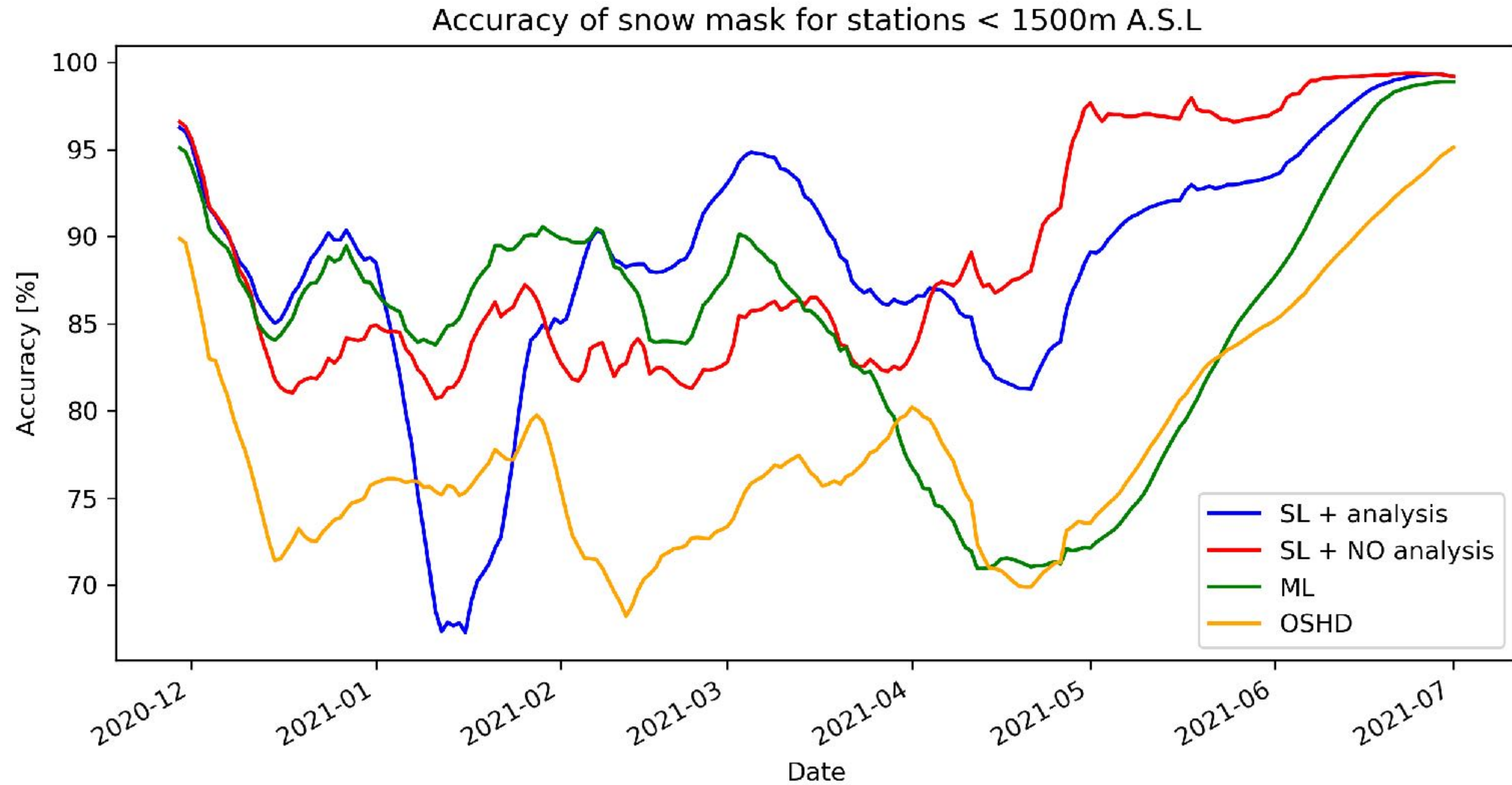
- Plan B will be adopted from current winter to end of life (COSMO)
- Snowpolino replaces satellite snow mask
- Development moves to ICON

EXTRA SLIDES

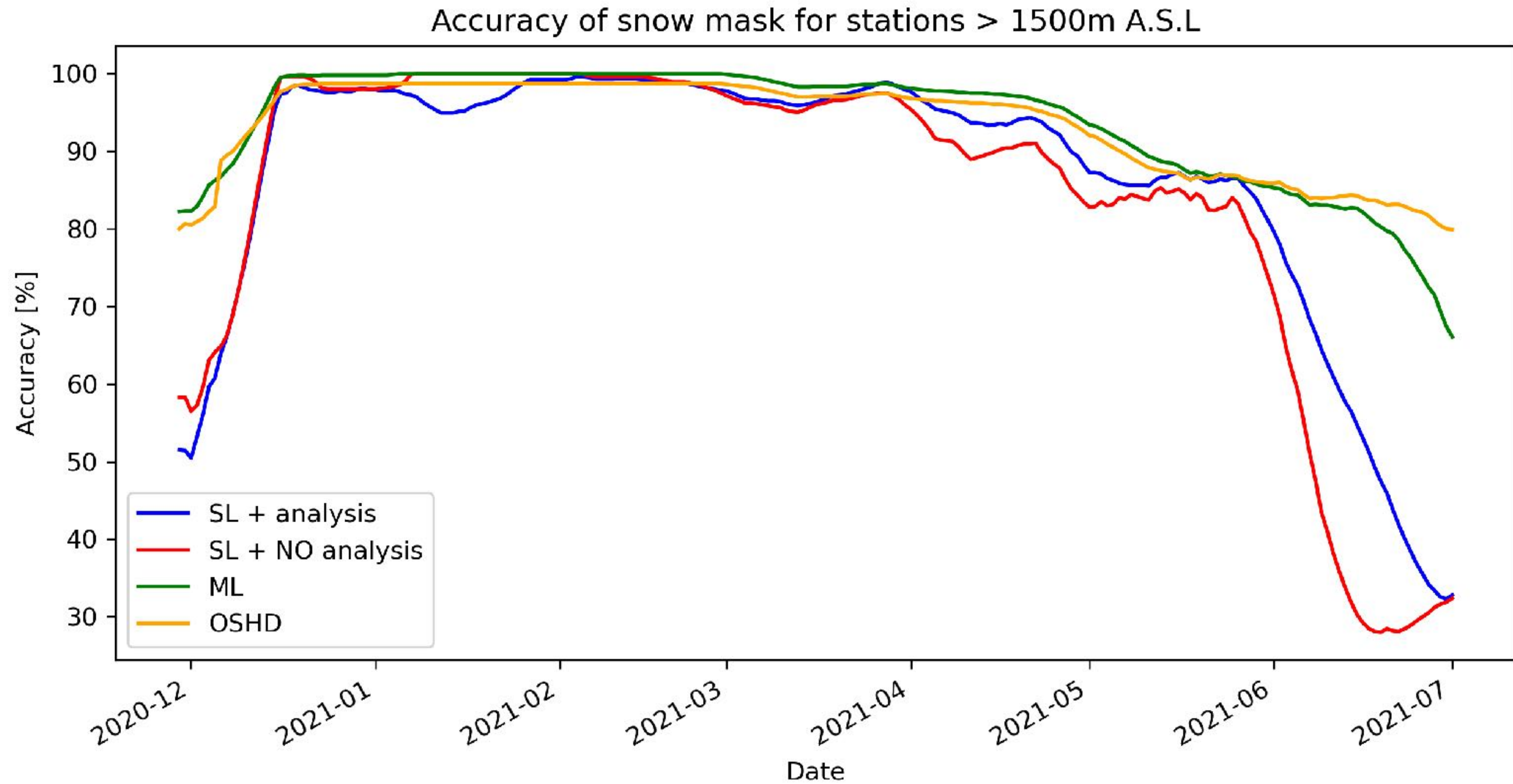
EXTRA SLIDES



EXTRA SLIDES



EXTRA SLIDES



PLAN B: SNOWPOLINO for snowmask

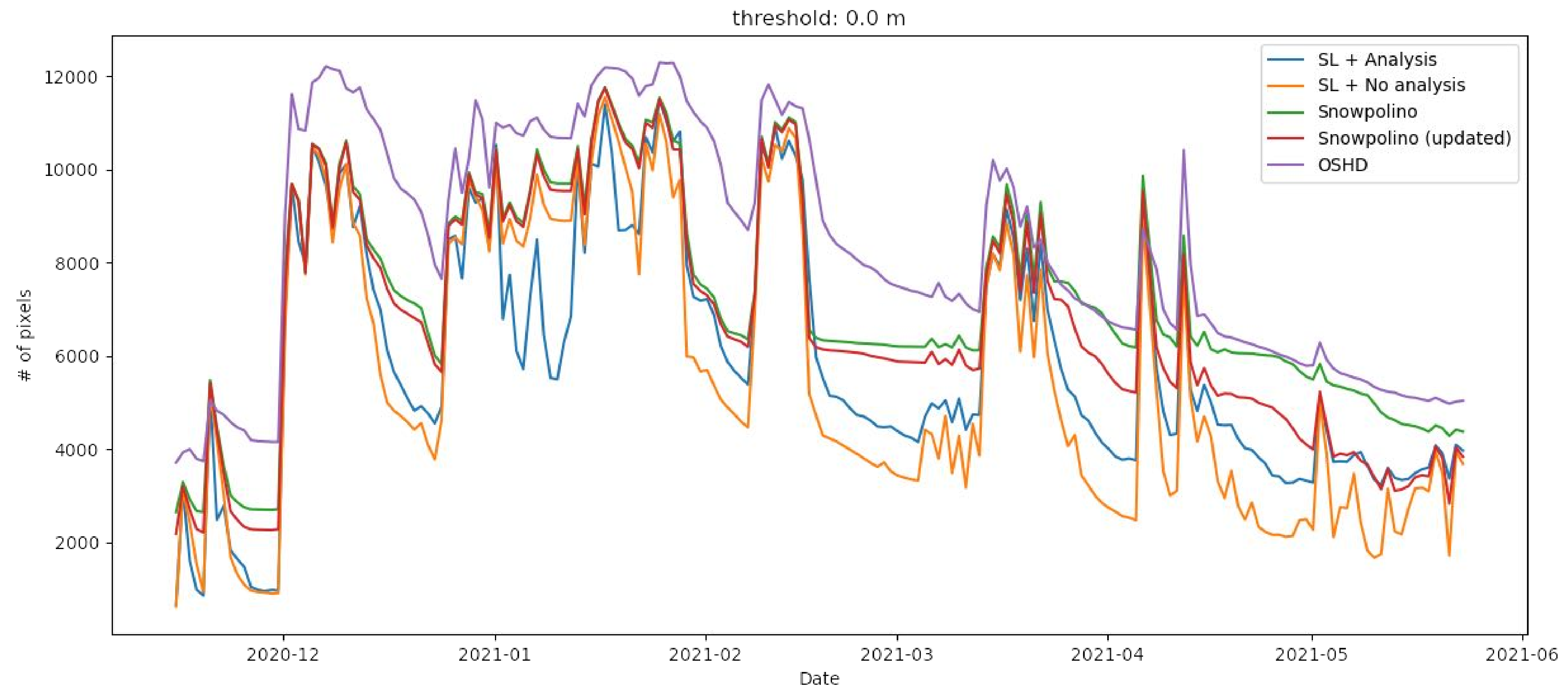
Run snowpolino in one member of KENDA-1 cycle

Snow station
measurements

Model First Guess
(from SL)

SNOWMASK
from
SNOWPOLINO

HOW ? WHY ?



PLAN B: SNOWPOLINO for snowmask

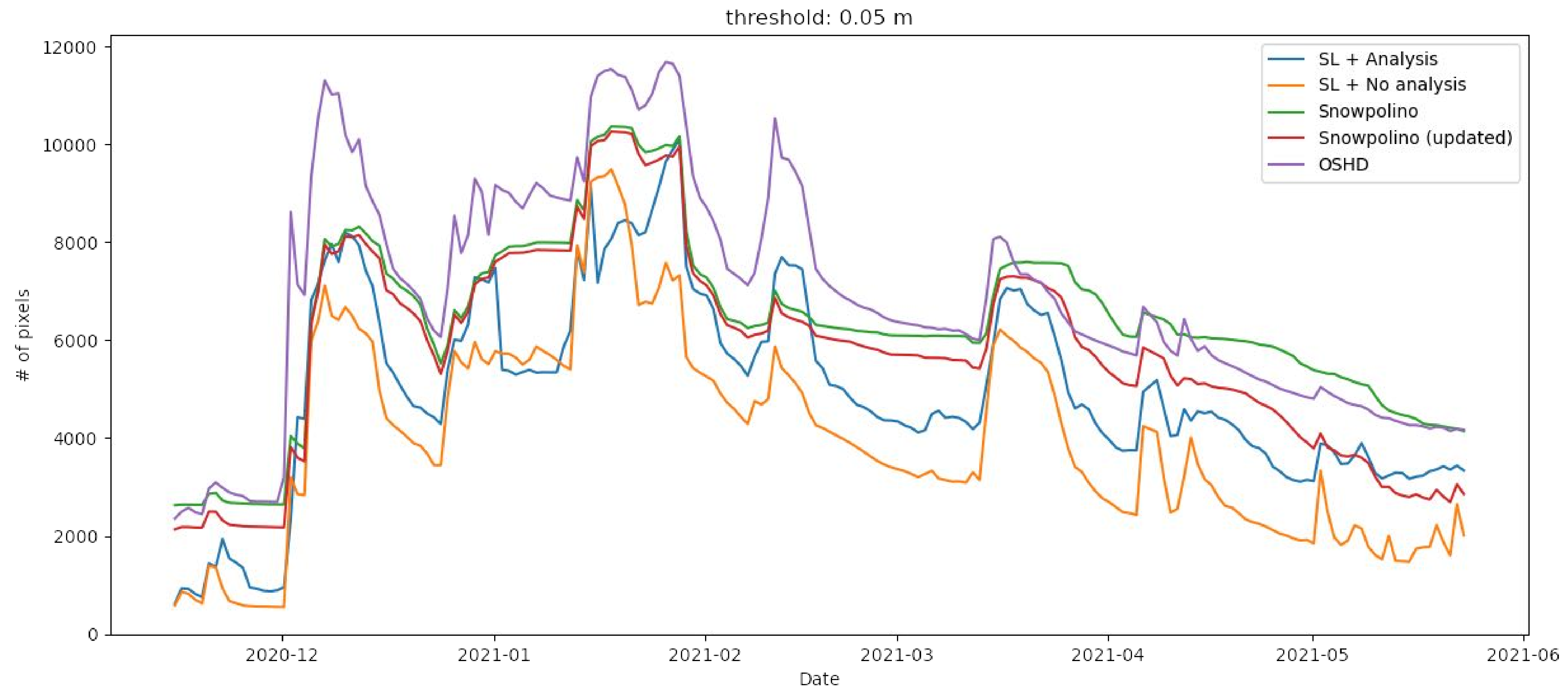
Run snowpolino in one member of KENDA-1 cycle

Snow station
measurements

Model First Guess
(from SL)

SNOWMASK
from
SNOWPOLINO

HOW ? WHY ?



PLAN B: SNOWPOLINO for snowmask

Run snowpolino in one member of KENDA-1 cycle

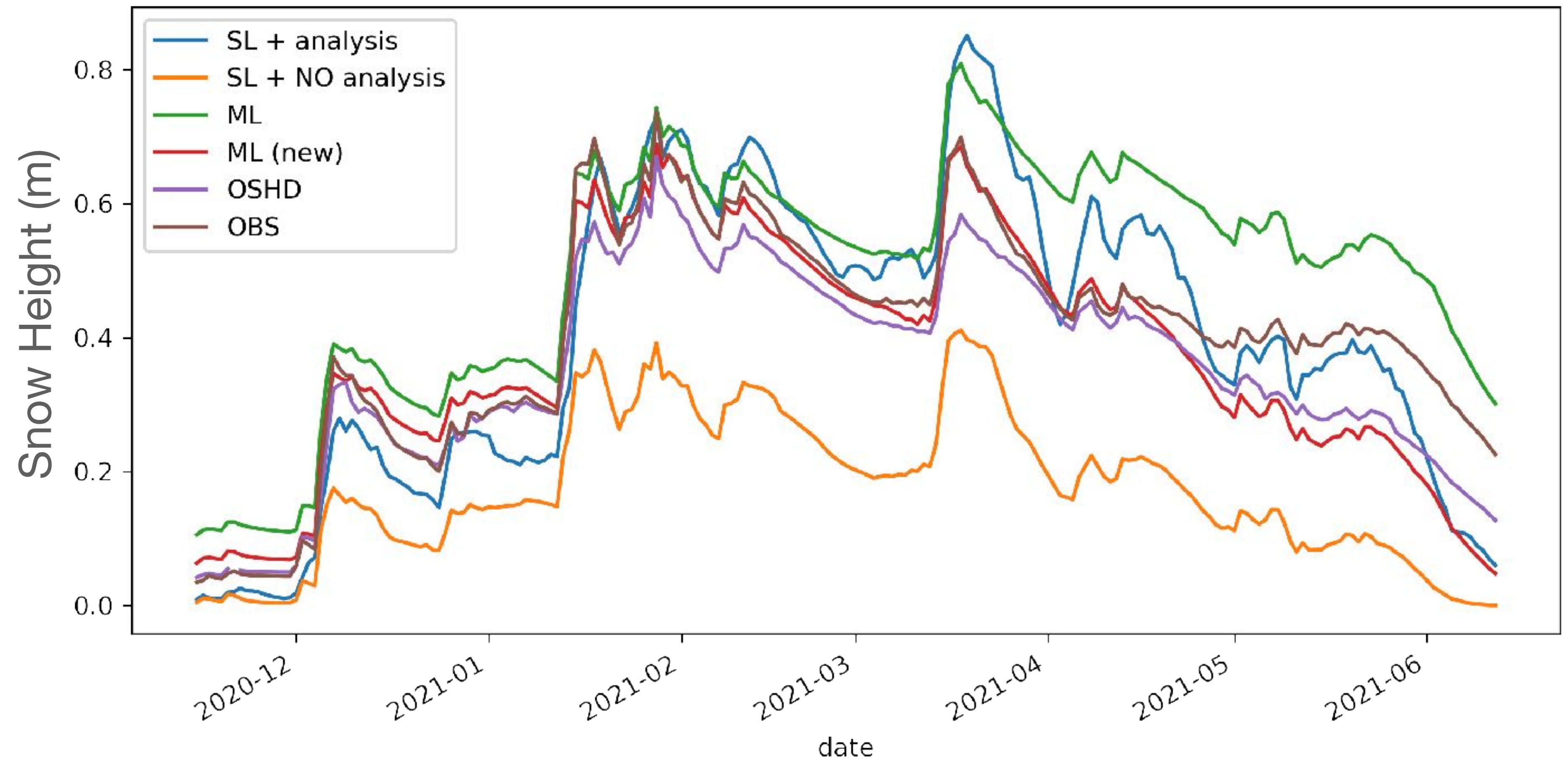
Snow station
measurements

Model First Guess
(from SL)

SNOWMASK
from
SNOWPOLINO

HOW ? WHY ?

Intercomparison with
300 stations



PLAN B: SNOWPOLINO for snowmask

Run snowpolino in one member of KENDA-1 cycle

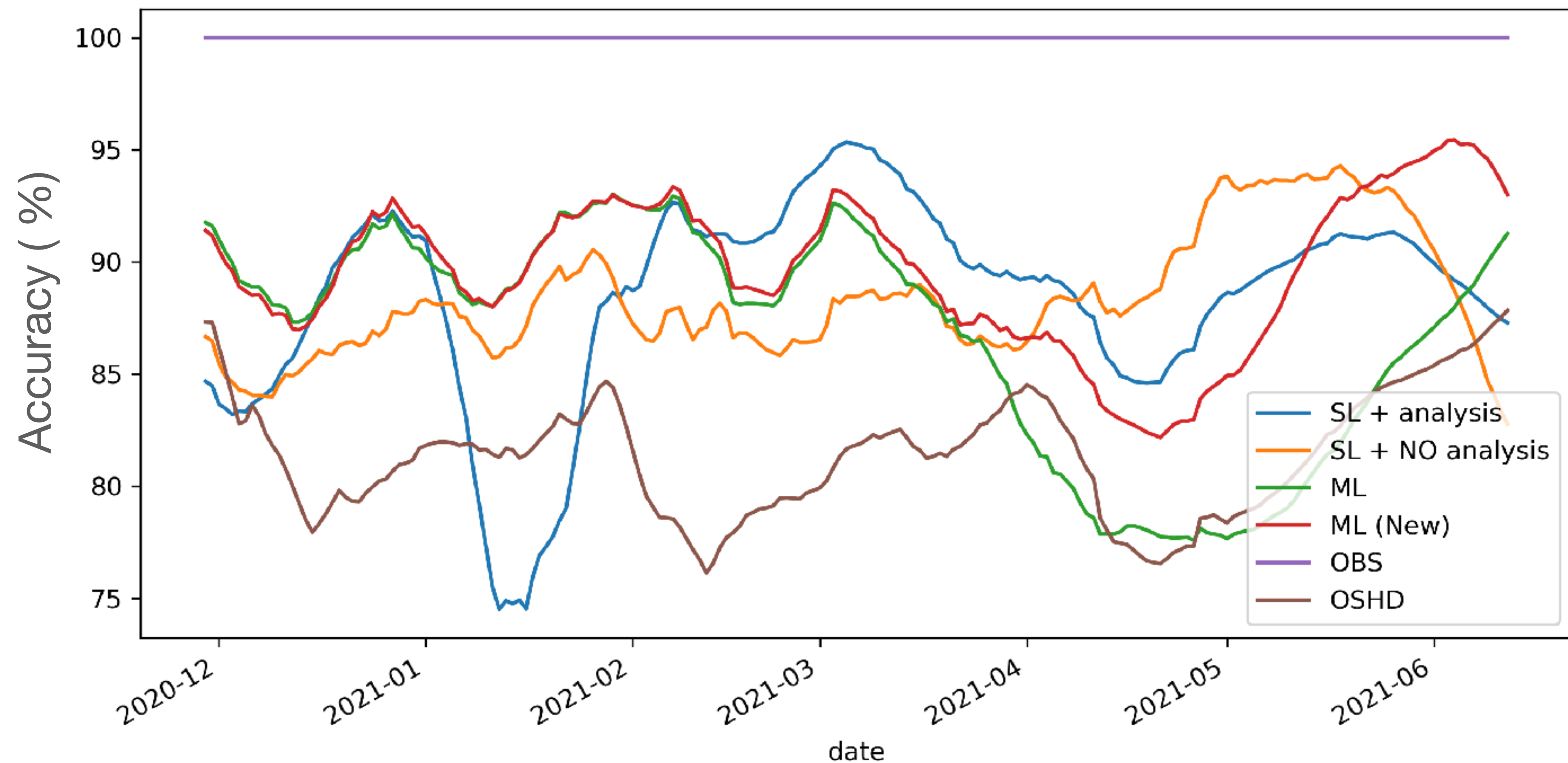
Snow station
measurements

Model First Guess
(from SL)

SNOWMASK
from
SNOWPOLINO

HOW ? WHY ?

Intercomparison with
300 stations



PLAN B: SNOWPOLINO for snowmask

Run snowpolino in one member of KENDA-1 cycle

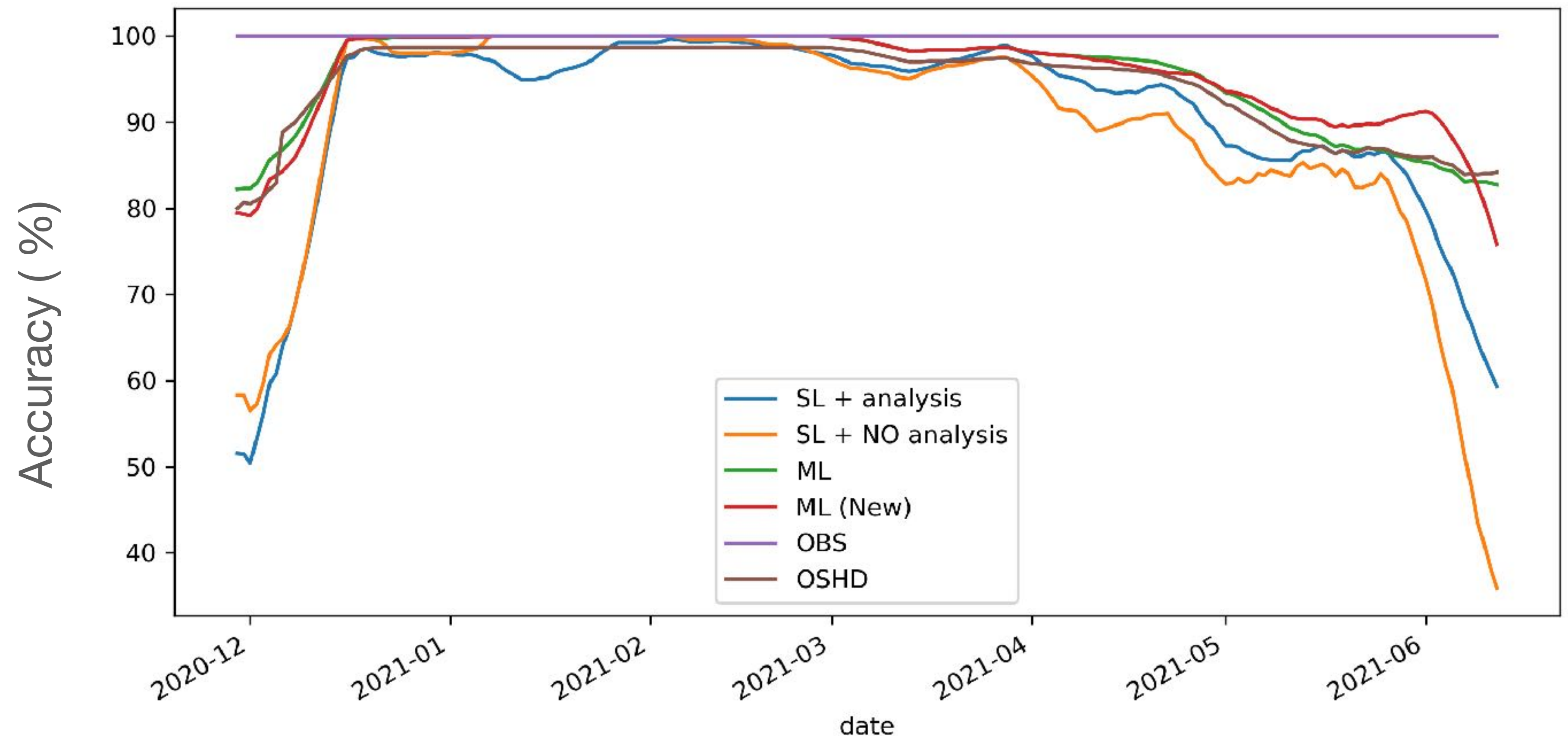
Snow station measurements

Model First Guess (from SL)

SNOWMASK from SNOWPOLINO

HOW ? WHY ?

Intercomparison with
78 high altitude stns
(> 1500m)



PLAN B: SNOWPOLINO for snowmask

Run snowpolino in one member of KENDA-1 cycle

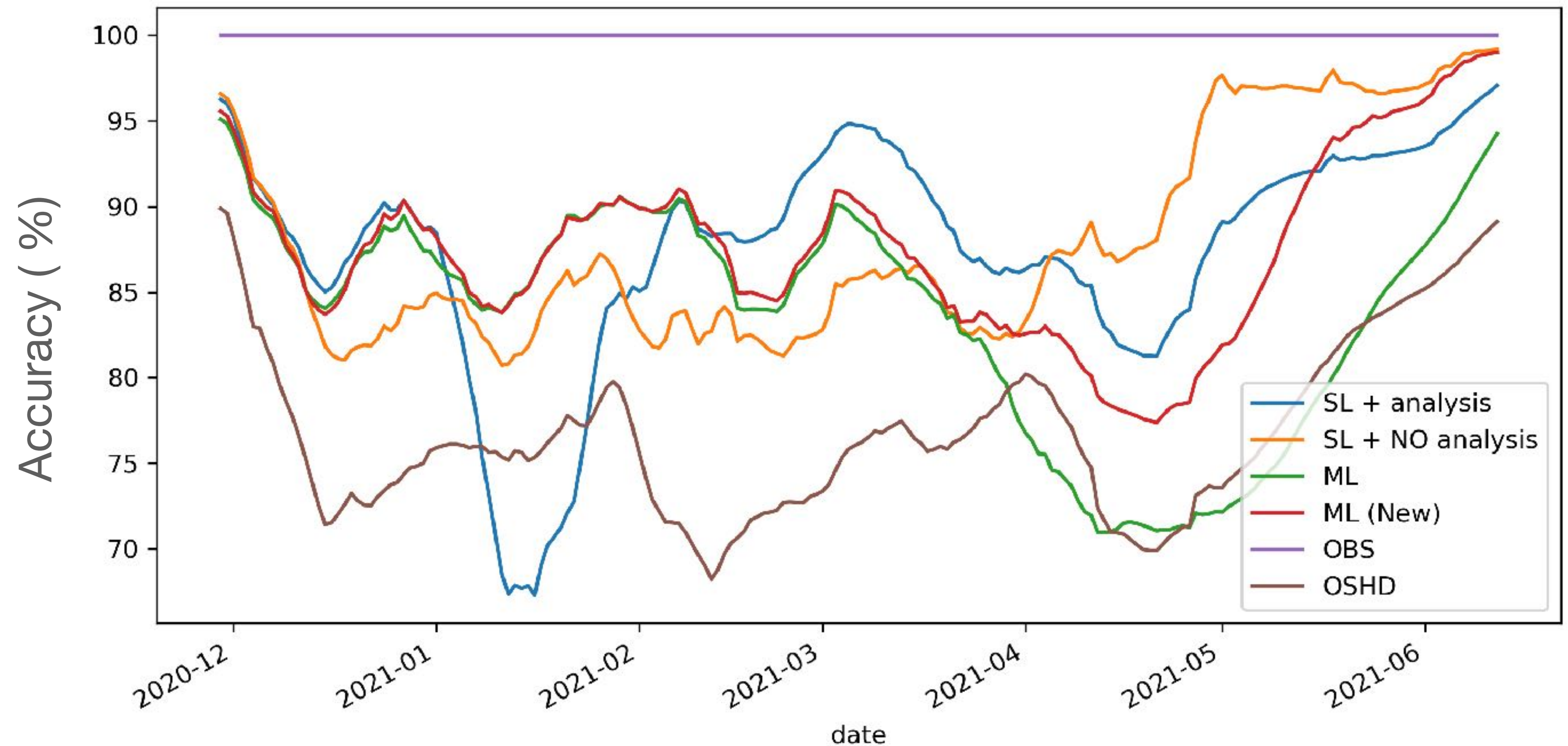
Snow station measurements

Model First Guess (from SL)

SNOWMASK from SNOWPOLINO

HOW ? WHY ?

Intercomparison with
223 low altitude stns
(< 1500m)



PLAN B: SNOWPOLINO for snowmask

Snow station
measurements

Model First Guess
(from SL)

SNOWMASK
from
SNOWPOLINO

HOW ? WHY ?

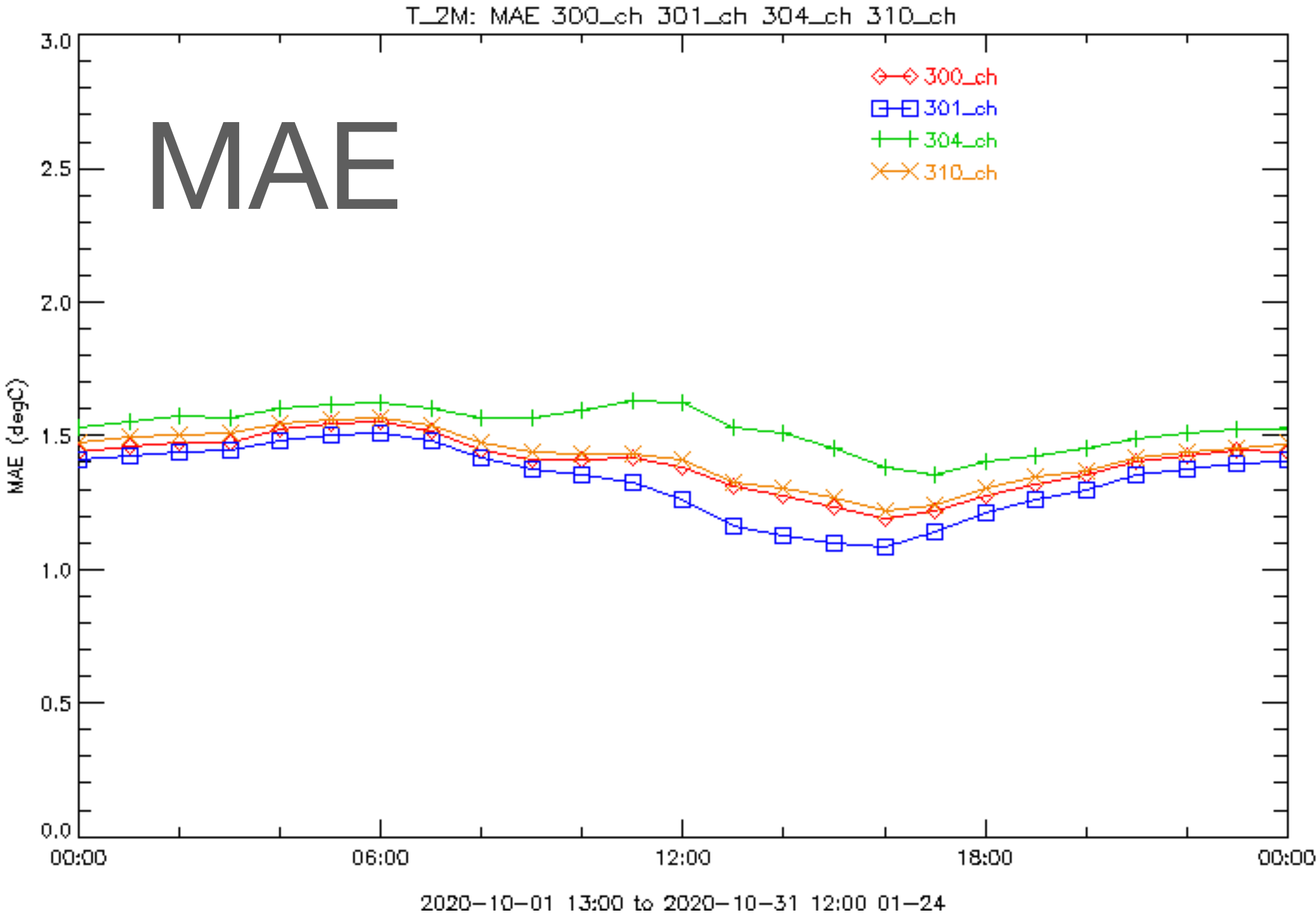
Run snowpolino in one member
of KENDA-1 cycle

- PLAN B is immediately adoptable
- SNOWPOLINO replaces Cinesat input

PLAN A: SNOWPOLINO F.T.W !

October

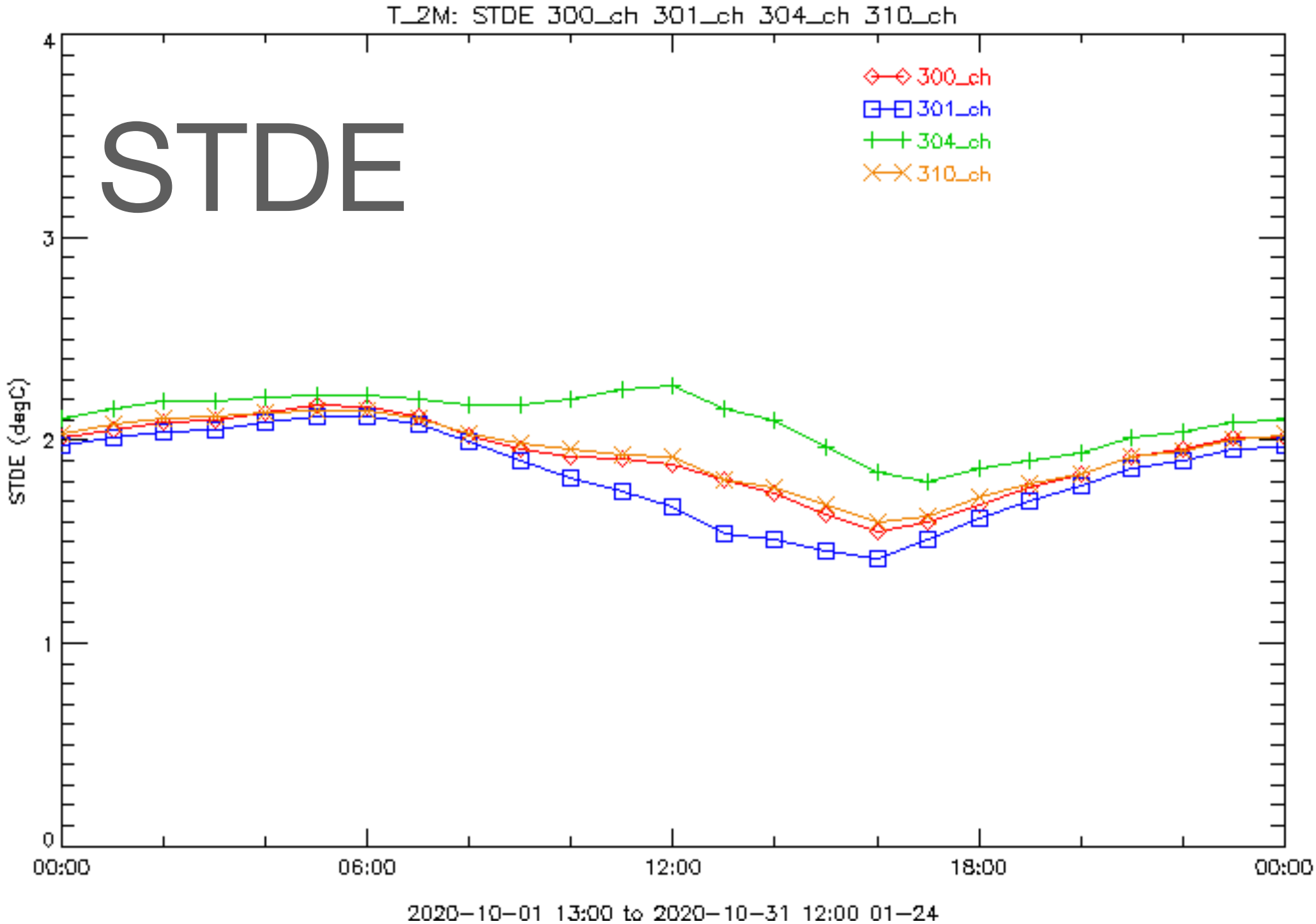
- 300_ch SL + ANALYSIS
- 301_ch SL + No ANALYSIS
- 304_ch ML
- 310_ch ML (new)



Snow station measurements

Model First Guess
(from Snowpolino)

SNOWMASK
from
SNOWPOLINO (KENDA)



PLAN A: SNOWPOLINO F.T.W !

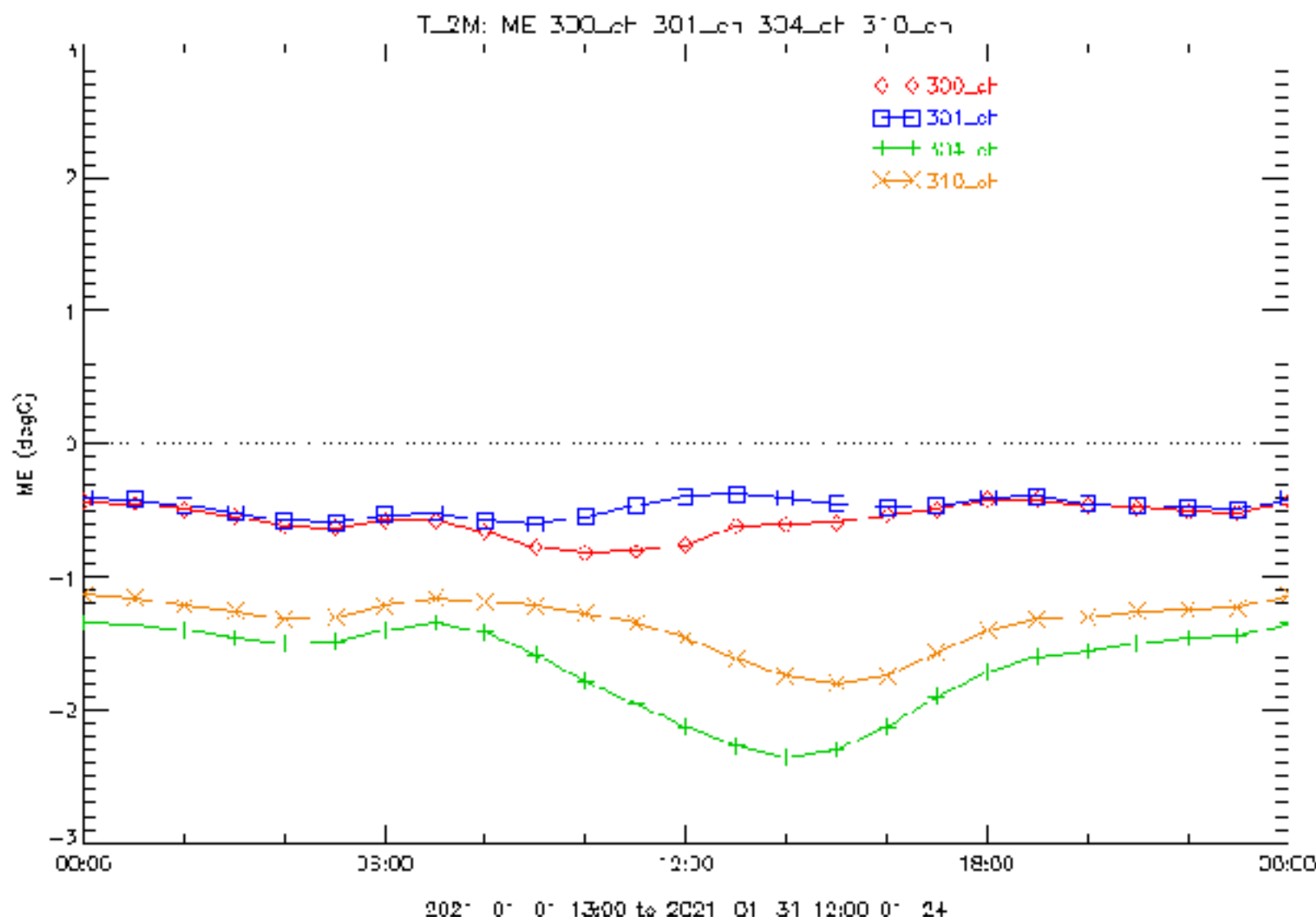
Snow station measurements

Model First Guess
(from Snowpolino)

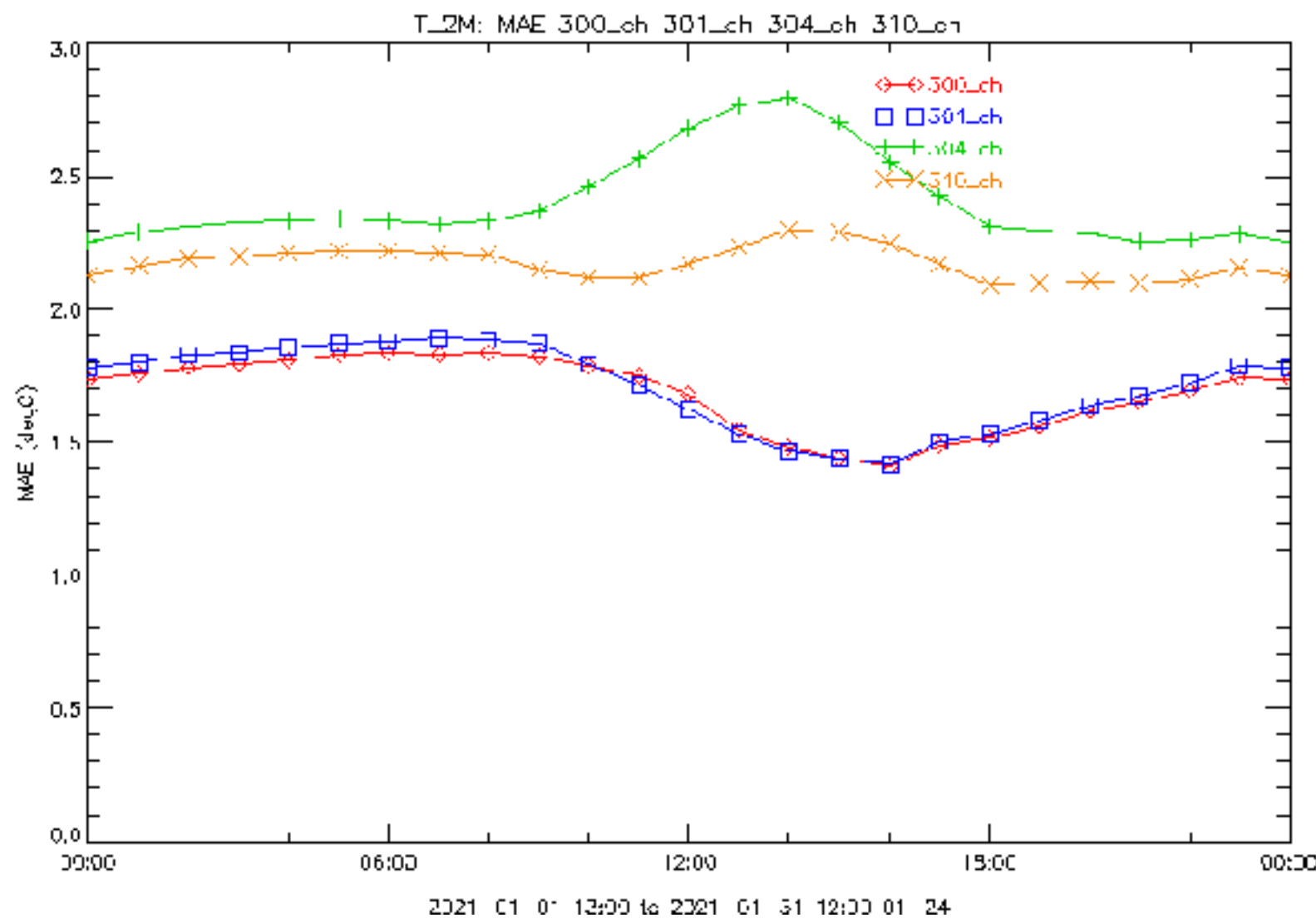
January

- 300_ch SL + ANALYSIS
- 301_ch SL + No ANALYSIS
- 304_ch ML
- 310_ch ML (new)

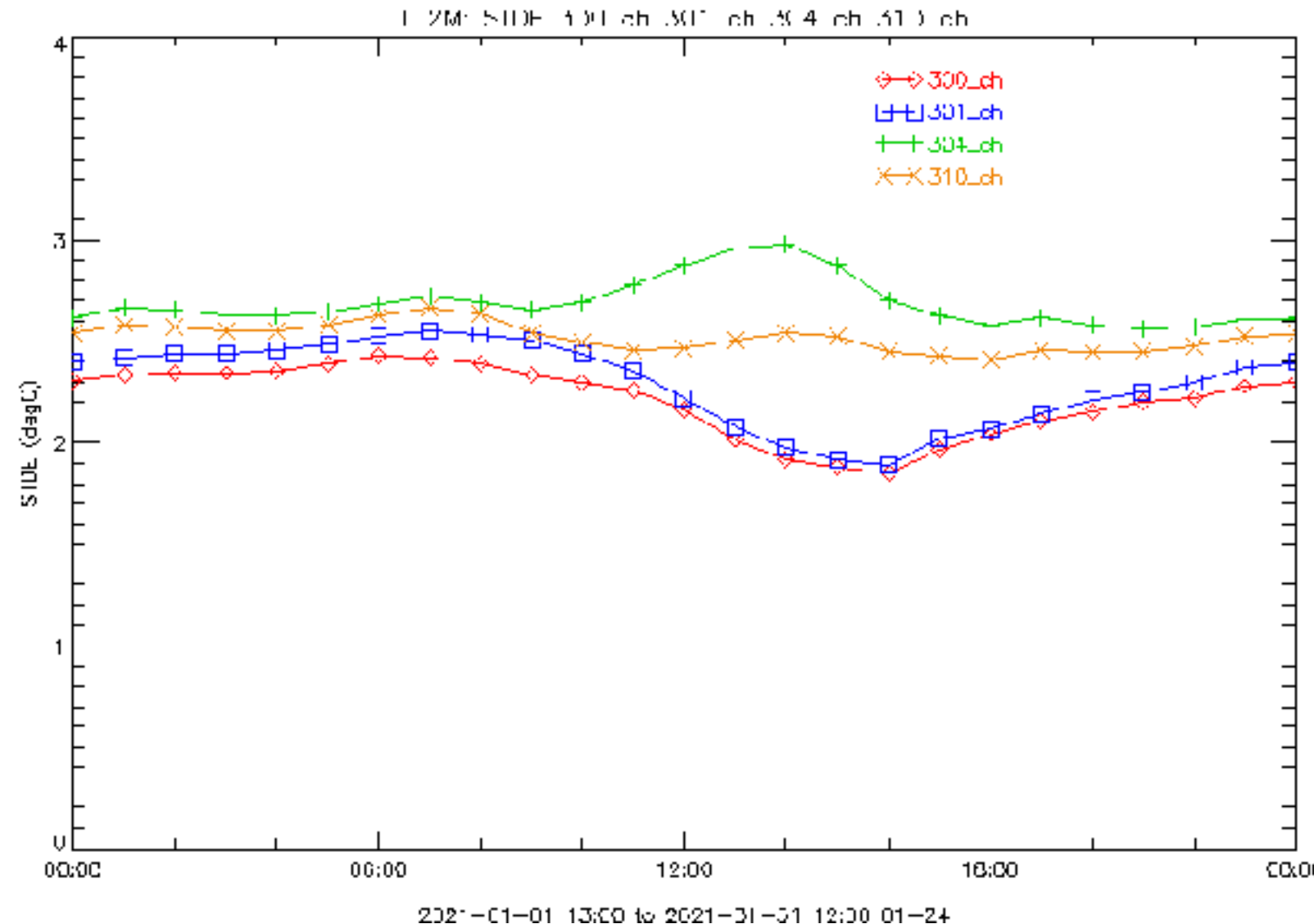
SNOWMASK
from
SNOWPOLINO (KENDA)



ME



MAE



STDE

PLAN A: SNOWPOLINO F.T.W !

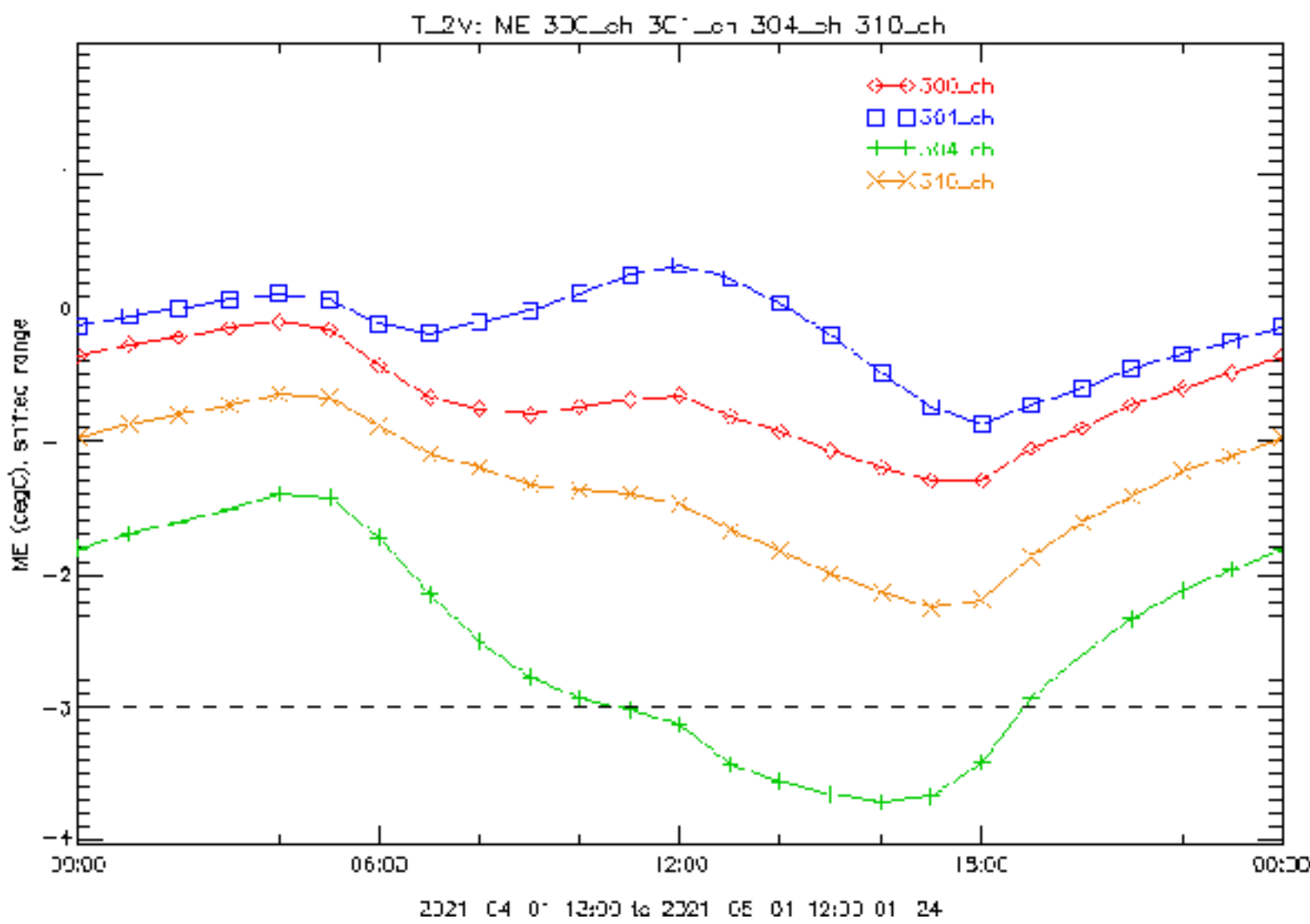
Snow station measurements

Model First Guess
(from Snowpolino)

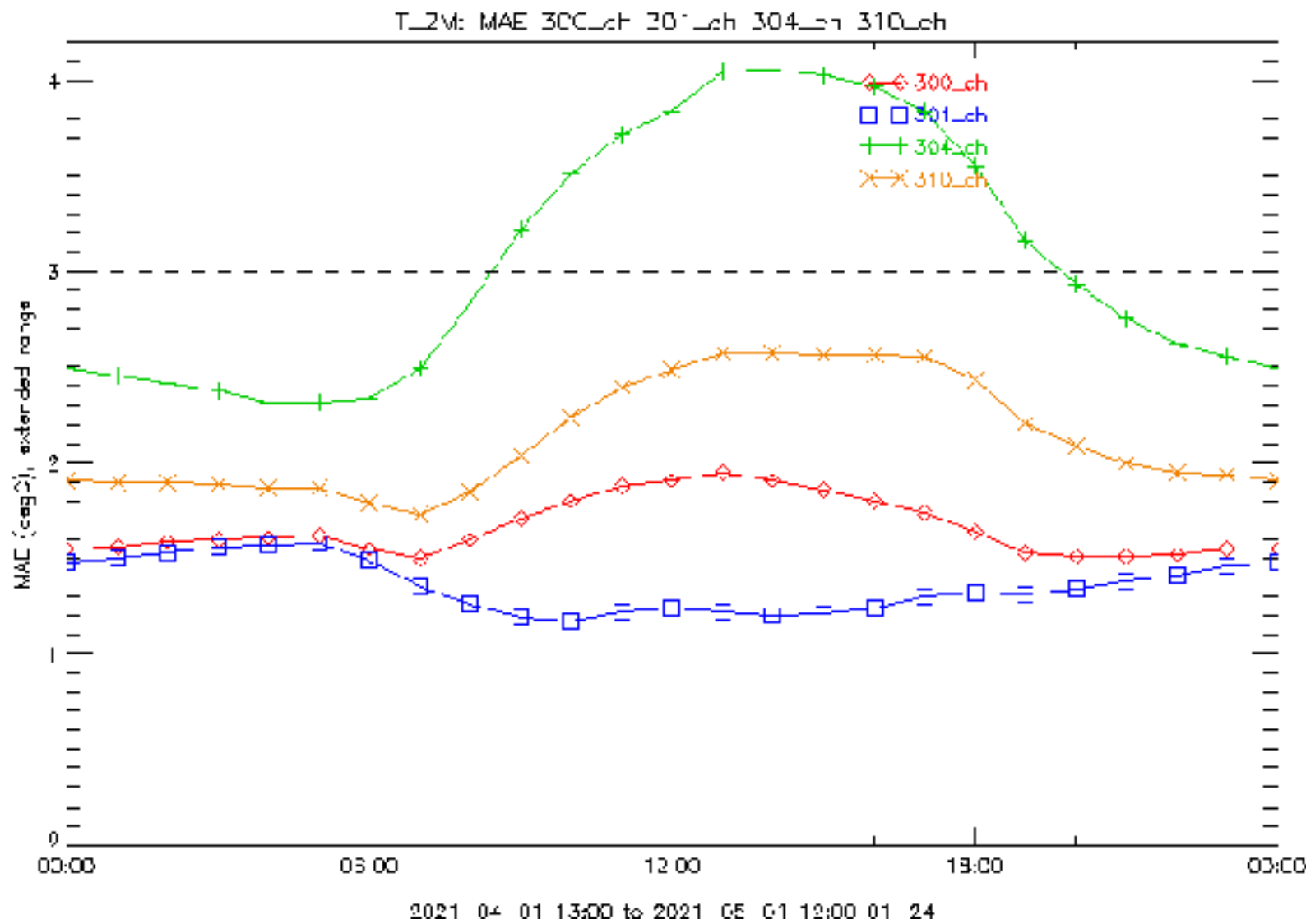
April

- 300_ch SL + ANALYSIS
- 301_ch SL + No ANALYSIS
- 304_ch ML
- 310_ch ML (new)

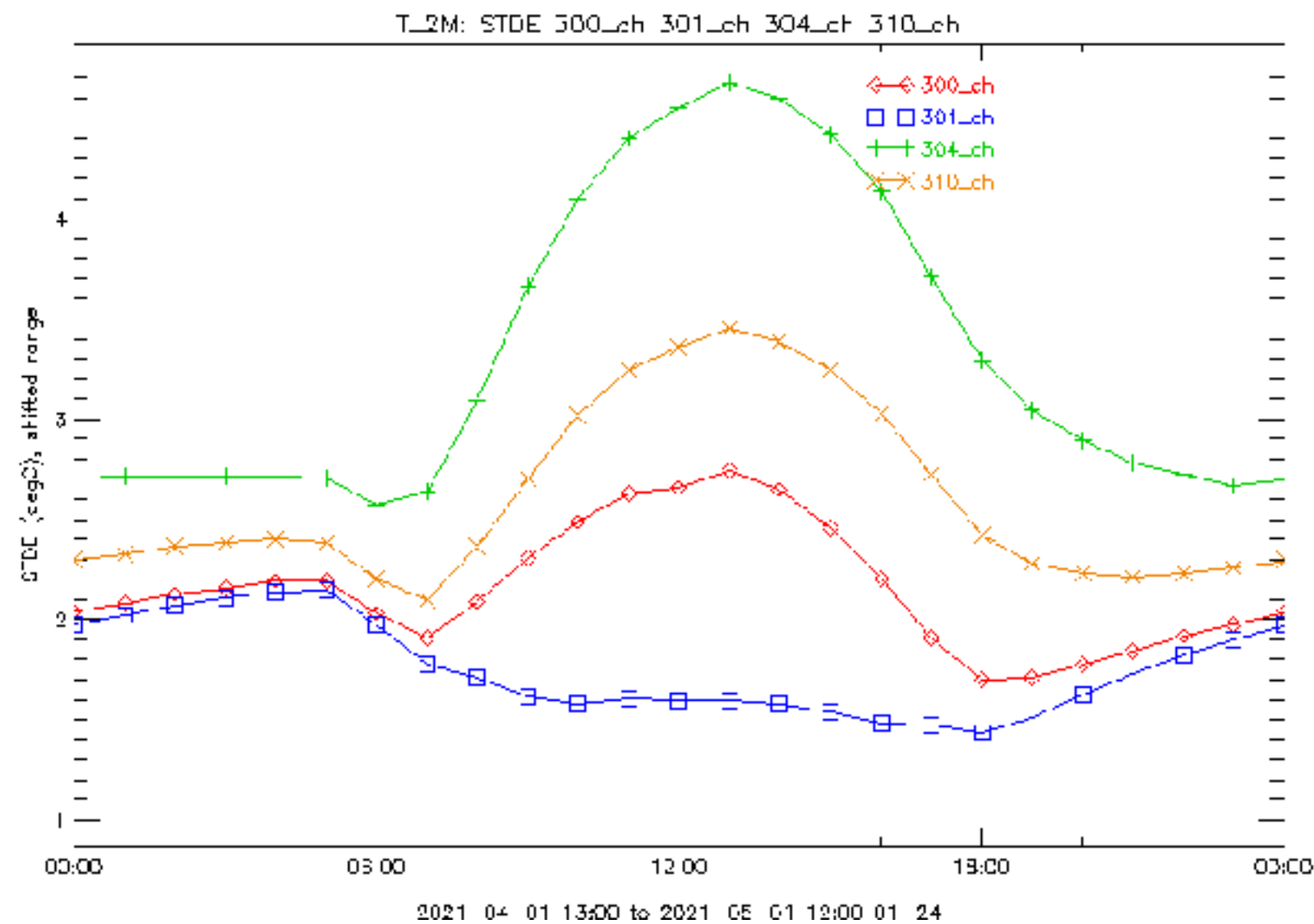
SNOWMASK
from
SNOWPOLINO (KENDA)



ME



MAE



STDE

PLAN A: SNOWPOLINO F.T.W !

Snow station measurements

Model First Guess
(from Snowpolino)

SNOWMASK
from
SNOWPOLINO (KENDA)

- Too many 'metrics' - need help is evaluating
- Without much tuning, the results 'seem' reasonable
- Can it be adopted ?

Decisions

PLAN A

Snow station measurements

Model First Guess
(from Snowpolino)

SNOWMASK
from
SNOWPOLINO (KENDA)

PLAN B

Snow station measurements

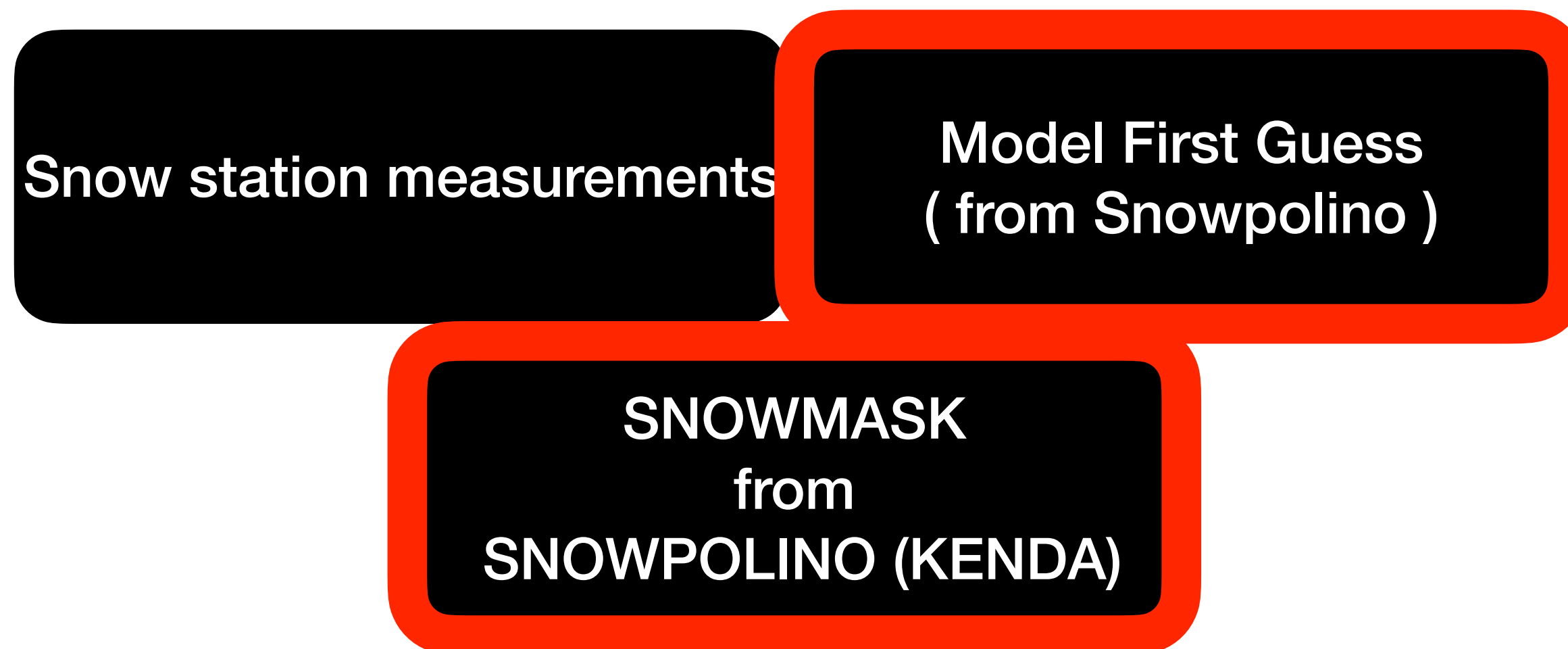
Model First Guess
(from SL)

SNOWMASK
from
SNOWPOLINO

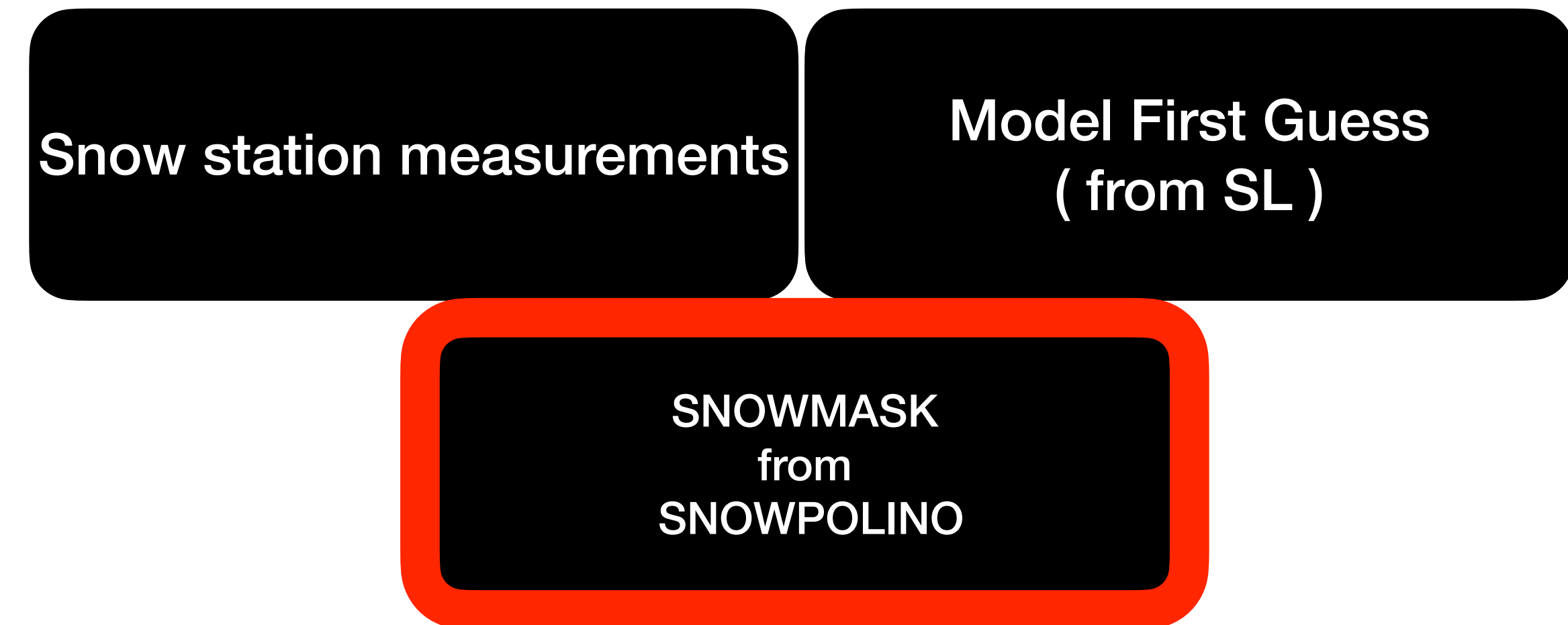
- We strongly suggest implementing Plan B immediately -
To do:
 - * Run full KENDA-1 domain OR choose only KENDA-2 ?
 - * Re-run a season in a 'fake' opr mode ?
- For Plan A: improve decision-making tools - adopt movero 'properly'.

Thoughts (warning: partly philosophical)

PLAN A



PLAN B



- Re-emphasis : why are we doing this ? SL even without analysis seems to be doing fine (as far as the atmosphere goes)
- Need internal support: a new ‘experiment’ in movero is needed to come up with a systematic ‘surface+snow’ verification