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AROME refactoring

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April 3, 2025

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Refactoring work in SPTR/WP10

- Ole Lindberg and I have worked on refactoring Arome
- Refactoring required to run on GPUs
- Goal is to make the code consistent with coding standard
- We visited Météo-France in June

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rolfhm-apl-arome-refactoring-2

- Merged into ACCORD-NWP/IAL on March 11
- 244 files and 13000 lines changed according to github
- Lots of changes throughout APL_AROME and PHYEX
- Some spillover into ARPEGE and ALARO

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Incomplete NPROMA blocks

- All arrays in APL_AROME have lead dimension KLON
- Loops go from KIDIA to KFDIA
- Lots of changes in mpa to get correct calls to PHYEX
- Surfex still has some incomplete blocks
- Will cause some copying of 3D fields, but difficult to fix

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Remove global variables

- No global variables in APL_AROME anymore
- Some remain in windfarm and nudging
- New structures for forcing and SCM
- New YRTENDRA object in YRML_PHY_MF to handle hydrometeor indices

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Removed extra dimension in PHYEX

- PHYEX routines used to have an extra dimension
- Necessary to be consistent with MesoNH
- Ole did a huge job of removing them
- Most dimensions consistent with AROME
- More dimensions fixed in latest version of PHYEX

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Removed SWAP routines

- PHYEX returns total tendencies
- AROME expects change in tendencies
- This was handled by confusing SWAP routines
- Swap routines replaced by explicit calculations

```
PTENDTT(JLON,JLEV) = PTENDTT(JLON,JLEV)
                   + PTHS(JLON,JLEV)
                   - ZTHSIN(JLON,JLEV)
```

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CPUTQY_AROME_LOOP removed

- Tendencies were stored with two routines
- CPUTQY_AROME_LOOP and CPUTQY_AROME_EXPL
- LOOP used to handle fields in PGFLT1 array
- EXPL used to handle fields in YDMF_PHYS_NEXT_STATE
- All tendencies now handled by wrapper and EXPL
- PGFLT1 removed

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HARATU

- Ole and Wim renamed vdfdasdfsd to edmf_...
- Several rounds of refactoring and cleanup
- Lots of code never used and could be removed

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EZDIAG

- YTHRAD field moved to YDVARS
- EZDIAG only used by SPP and Windfarm parametrisation
- EZDIAG (and global variables) removed from Windfarm in dev-CY49T2h by Jacob
- Used to get actual SPP pattern out
- Can be moved to dedicated field
- Then PGFL can be removed
- Can PGP2DSDT (SPPT pattern) be moved to a field

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MF_PHYS_BASE_STATE

- MF_PHYS_BASE_STATE was partially hard coded
- Rewritten in line with MF_PHYS_NEXT_STATE
- Removed pointers referencing the GFL array
- Data now accessed by pointers, so added %P everywhere

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Thank you for your attention