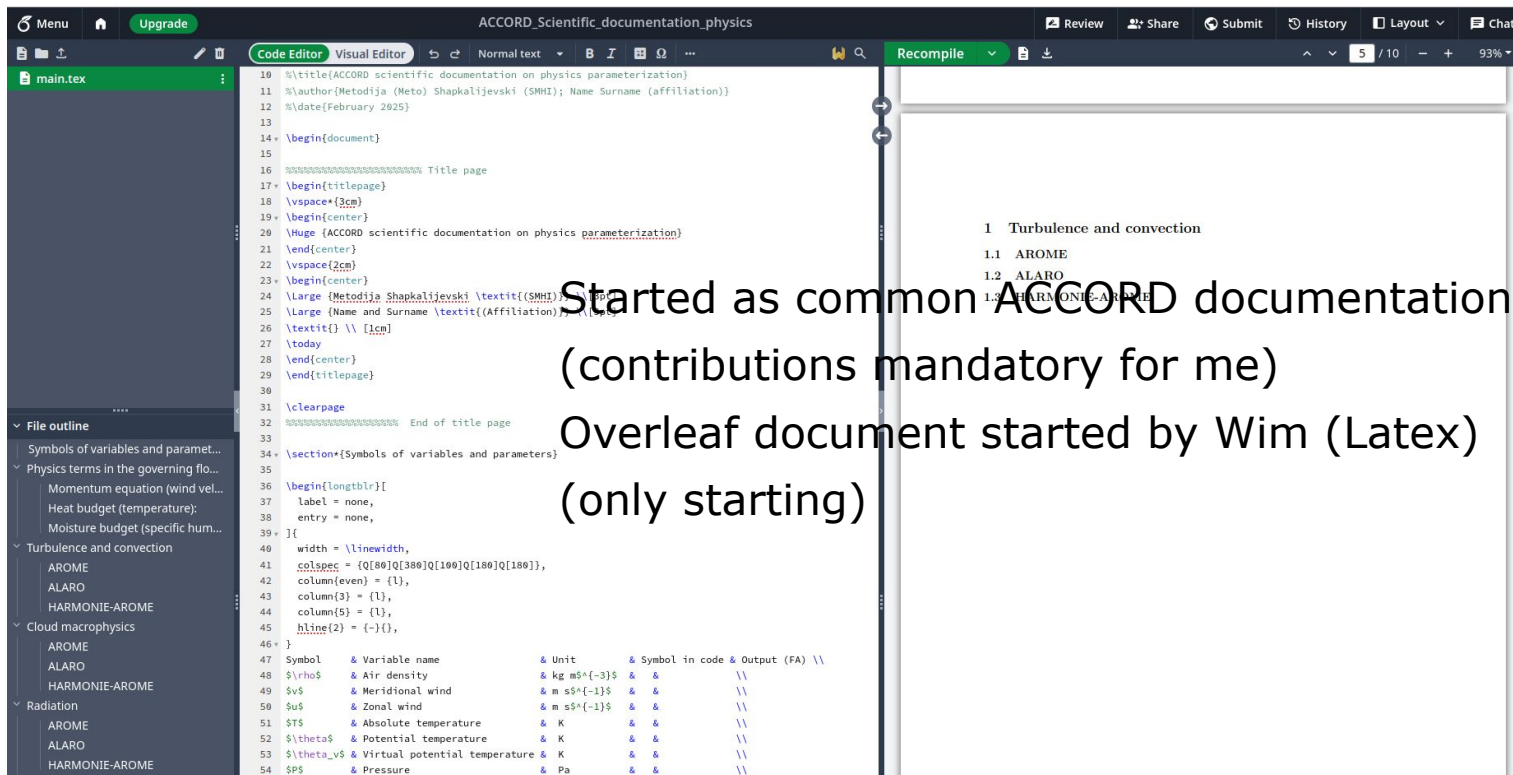


Some future ALARO activities

Martina Tudor

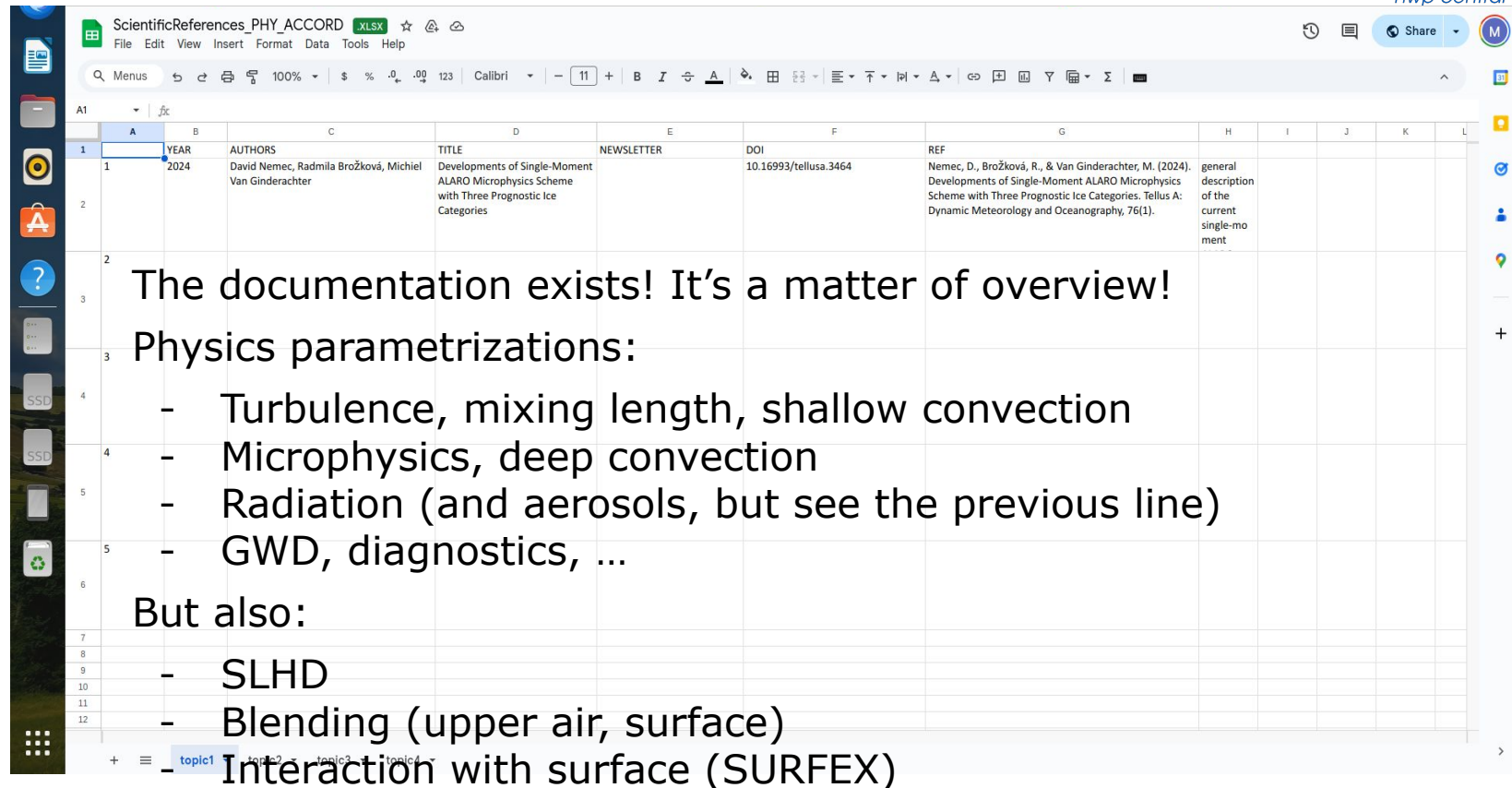
Physics documentation



Started as common ACCORD documentation for physics
(contributions mandatory for me)

Overleaf document started by Wim (Latex)
(only starting)

ALARO documentation



YEAR	AUTHORS	TITLE	NEWSLETTER	DOI	REF	
2024	David Nemec, Radmila Brožková, Michiel Van Genderachter	Developments of Single-Moment ALARO Microphysics Scheme with Three Prognostic Ice Categories		10.16993/tellusa.3464	Nemec, D., Brožková, R., & Van Genderachter, M. (2024). Developments of Single-Moment ALARO Microphysics Scheme with Three Prognostic Ice Categories. Tellus A: Dynamic Meteorology and Oceanography, 76(1).	general description of the current single-moment

The documentation exists! It's a matter of overview!

Physics parametrizations:

- Turbulence, mixing length, shallow convection
- Microphysics, deep convection
- Radiation (and aerosols, but see the previous line)
- GWD, diagnostics, ...

But also:

- SLHD
- Blending (upper air, surface)
- Interaction with surface (SURFEX)

The previous effort could/should also lead to a published paper that could be used as a reference in the future.

- Its an overview, a summary but not repetition of already published material
 - What about the developments not published as scientific papers?
 - Describe the latest developments (some not published yet) or focus on what's published?
-
- Choosing the publisher (some condition open source code)

MU-MIP is an international project which seeks to characterise systematic and random component of model error across many different climate models. This is the first coordinated intercomparison of random model error, and will be used to inform stochastic parametrisation development.

Some key questions:

How should we best represent model uncertainty/random error using stochastic approaches?

To what extent should this representation be model specific or a fundamental property of atmospheric models?

Are current approaches justified? How can they be improved?

Can a coarse-graining approach be used to validate and compare high-resolution simulations and their behaviour across scales.

https://opensource.umr-cnrm.fr/attachments/download/5543/20240123_EPS_michieltvg.pdf

The URANIE platform

Main purpose:

- Uncertainty propagation
- Surrogate model generation
- Sensitivity analysis
- Optimisation
- Reliability analysis

Works for HARMONIE scrips in EC
combine it with MUSC

Michiel and James

Combining URANIE and HarmonEPS

- EPS workflow is too complex to use as black-box
 - Staging of Observations/LBCs
 - Cycling - DA
 - Perturbations
- ⇒ Integrate different URANIE steps into the HARMONIE scripting system

© Patrick Samuelson The conclusion from ta surface ACCORD WW in Brussels from 2024 is that we should aim for three patches with the following configurations:

- Patch 1, bare soil, rocks and permanent snow
 - Configuration: Soil Organic Carbon (SOC) + Dry Soil Layer (DSL)
- Patch 2, forest
 - Configuration: MEB + SOC + Litter + newMLCH (Increased SOC percentage for the top two layers)
- Patch 3, low vegetation (grass and crops)
 - Configuration: MEB + SOC + DSL + newMLCH (Increased SOC percentage for the top two layers)

Please note that

- current cy49t2 code does not allow activation of MEB for non-forested patches. A PR to allow this exists for cy49t2h. Patrick tested this during the DEODE WW in Prague.
- the SOC option requires additional input files. [Global versions of these are now available via the SURFEX page here.](#)
- the DSL option requires new code. A PR for this exists for cy46h. It will be a PR for the cy49t2h repository (done?)
- the newMLCH option is under validation in experiments by the WW participants. Will be a PR when validated (done?)
- https://docs.google.com/presentation/d/1BdzWBbpSnvE9EYbDu2qvZTd_2ofj3l6vdMoNw9i51aM/edit#slide=id.g3283d3885e1_0_160 (Patrick's presentation explaining SURFEX options in CY46h1, CY48t3, CY49t2 and recommendations)

Thank you for your attention!