DAsKIT progress report

Aitmeziane, O., Ansper, I., Belghrissi, H., Bogatchev, A., Cengiz, Y., Chemrouk, G., Deckmyn, A., de Cruz, L., Dehmous, I., Dumitru, A., Hdidou, F., Khalfaoui, W., Güser, A., Kolonko, Mladenov, K., **M., Monteiro**, M., Sahlaoui, Z., Sezer, M., Stachura, G., Szczęch-Gajewska, M., Tsankov, M., Tsenova, B., Valcheva, R., 14 April 2021, video-conference

With collaboration of: Alena Trojakova, Benedikt Strajnar, Eoin Whelan, Pierre Brousseau, Jean-François Mahfouf, Roger Randriamampianina

Outline

- **preamble**
  - ACCORD RWP2021 WP DA8
  - DA starters KIT
  - Synopsis on the countries status
- **on-going activities**
  - *Highlighting*…
  - Further progress: workflow & communication
- **summary**
  - Achievements & short-term plans

DAsKIT→ ACCORD RWP2021 WP DA8

Countries (10)

Algeria, Belgium, Bulgaria, Estonia, Morocco,

Poland, Portugal, Romania, Tunisia, Turkey (ACCORD newcomers)

Data Assimilation (DA) <u>Capacity Building</u>

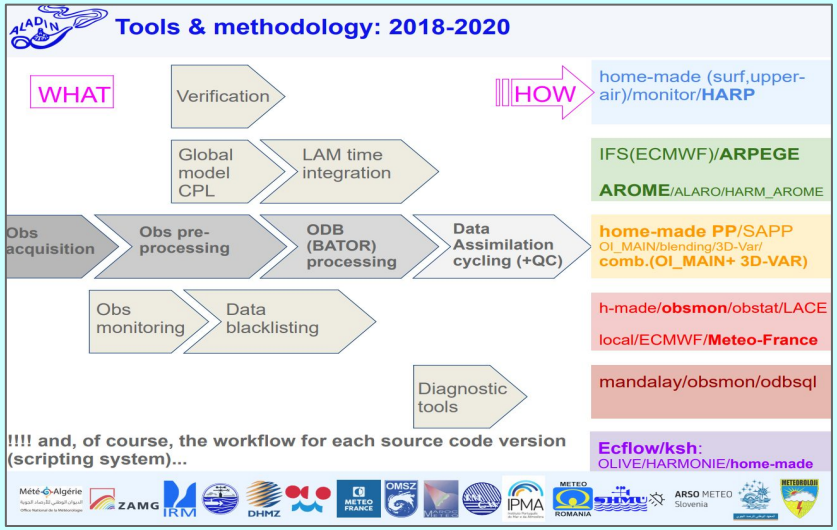
conversion of ALADIN/LACE DAsKIT programme to RWP2021 DA8 (with support of HIRLAM experts and tools ...)

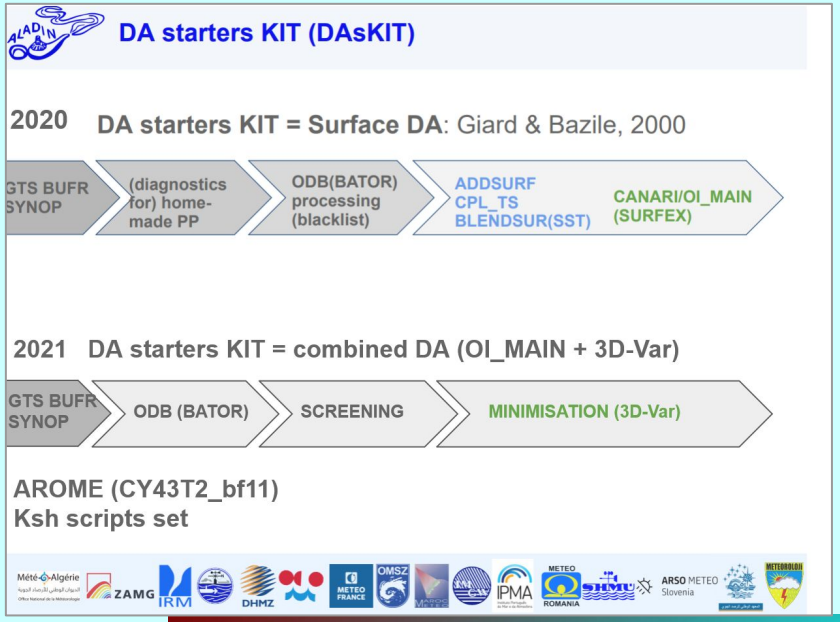
New group dynamics less status reports

more (recorded) dedicated actions

involve in further ACCORD DA activities

DAsKIT→ ACCORD RWP2021 WP DA8





http://www.umr-cnrm.fr/aladin/IMG/pdf/nl15.pdf

http://www.umr-cnrm.fr/aladin/spip.php?rubrique74

! Achievements (2020-2021)

+ Common implementation of T-codes cycle CY43T2
+ Testbed: combined DA solution, for one network

Synopsis on the countries status

Lack of computer is omitted here ...

	Data Acquisition			Data pre-processing		Data monitoring tools		BATOR	Surface DA		B-matrix computation		3D-Var DA legacy		Combined DA		Validation tool	
	SYNOP GTS home	TEMP	AMDAR	home made	common SAPP PoP-RMI	home MANDALAY OBD	com. OBSMON	1-2-3 obs types	cycled	oper	first	EDA	cycled	oper	cycled	oper	home made MONITOR	comm. HARP
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Highlighting… Surface DA

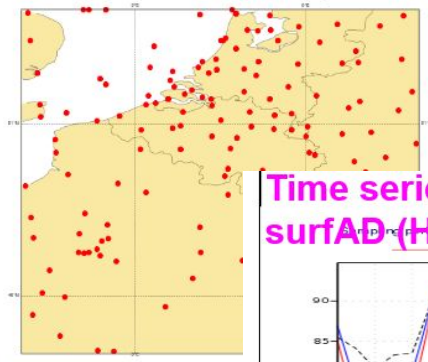
Lack of computer is omitted here ...

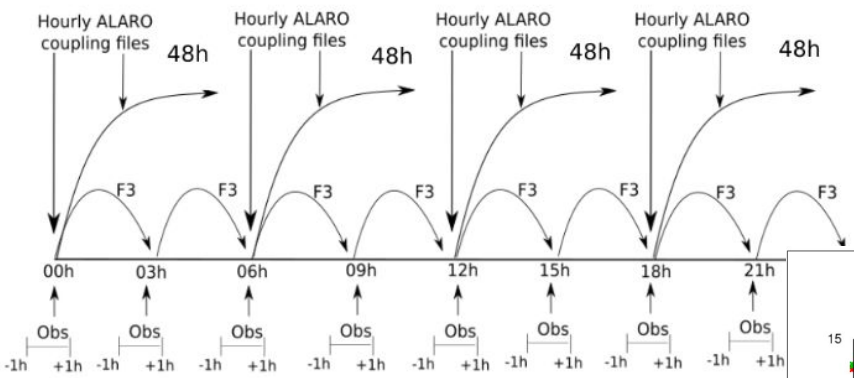
AROME operational setup with surface DA

Resolution	: 1.3 km
Observations	: Synop
Upper-air analysis	: None
Surface analysis	: CANARI_Oimain
Cycling frequency	: 3h hours
Coupling model	: ALARO 4km
Production time	: 00, 06 , 12, and 18h with 48h forecast range

RMI

SYNOP observations over AROME-Belgium domain

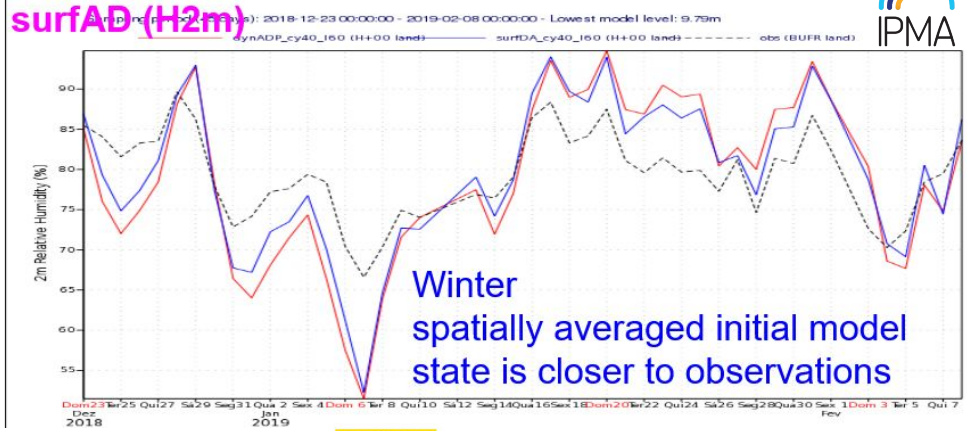


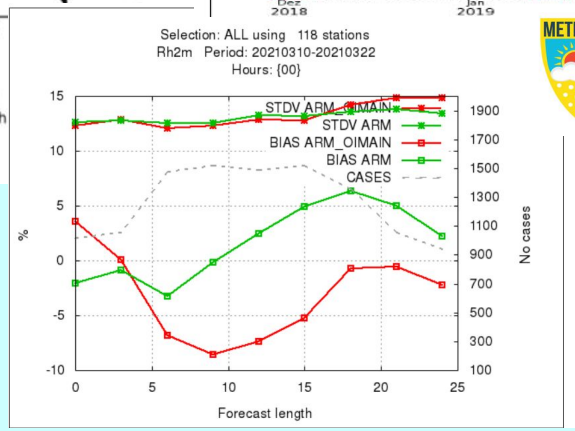


DAsKit Working days , Vienna September 2020

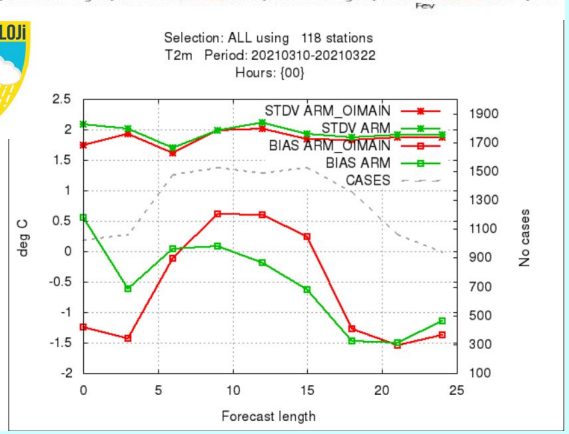
Time series diagnostics surfAD (H2m)

IPMA





METEOROLOJi



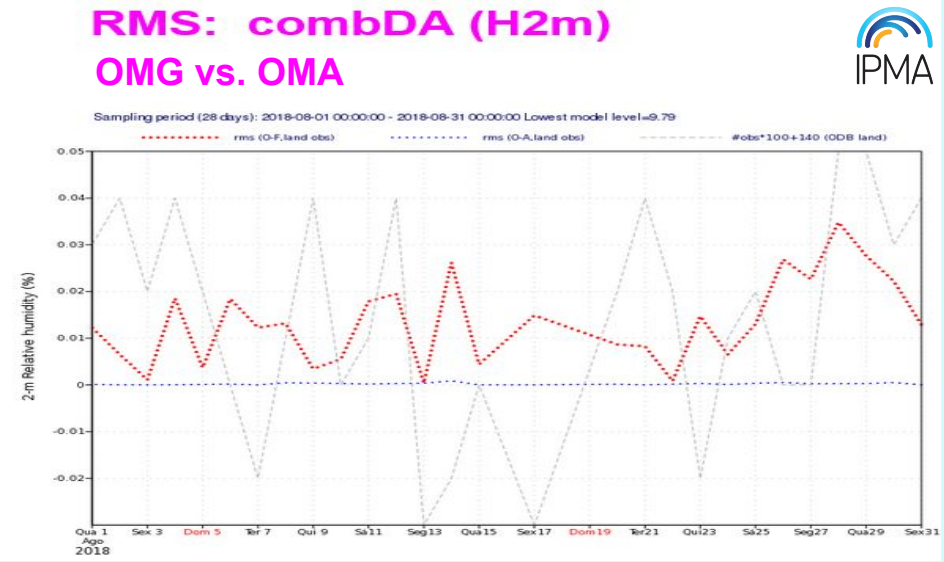
! Achievements (2020-2021)

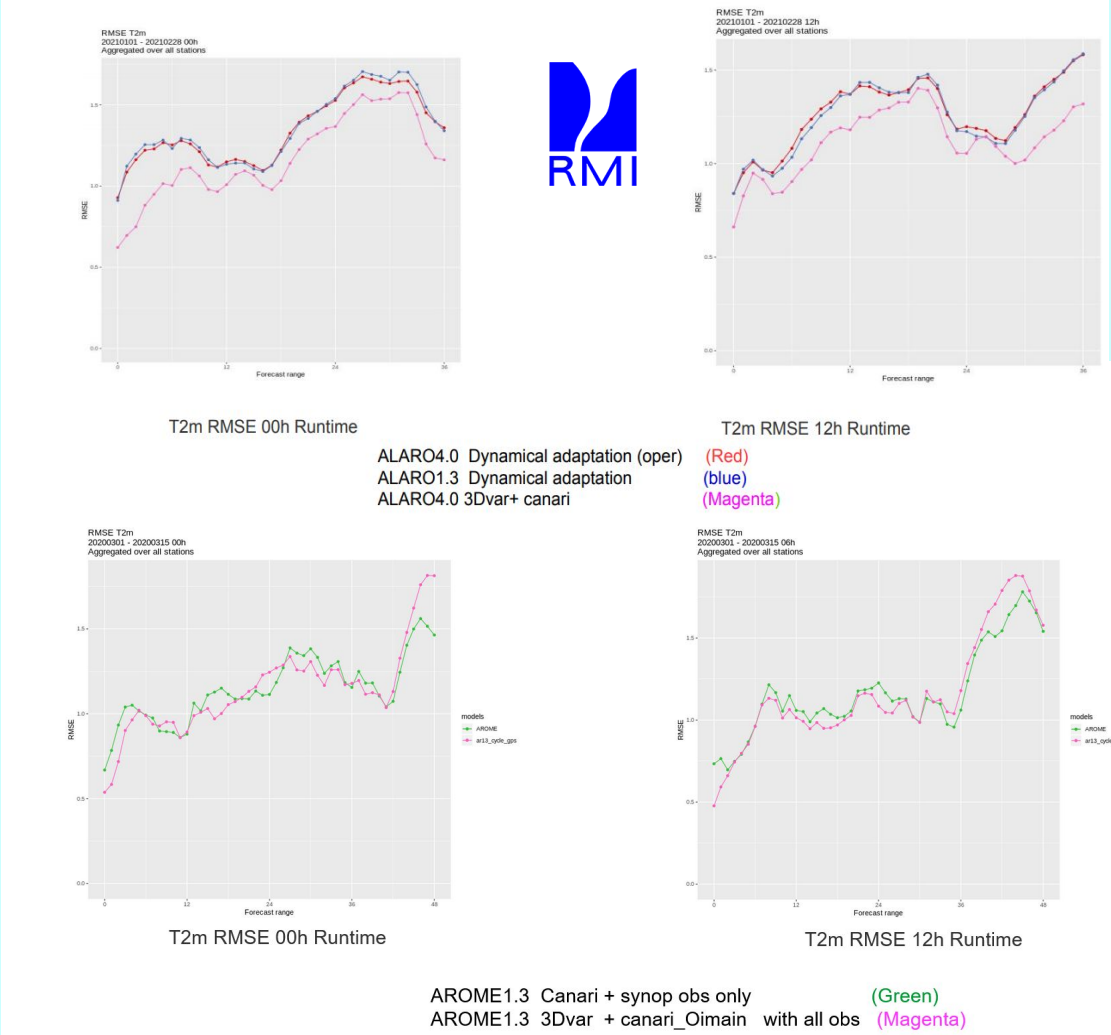
\+ operational surface DAsKIT

Results presented during the 2021 LACE & DAsKIT DAWD, visio-meeting, Vienna, September 2020

ACCORD

Highlighting… Combined DA





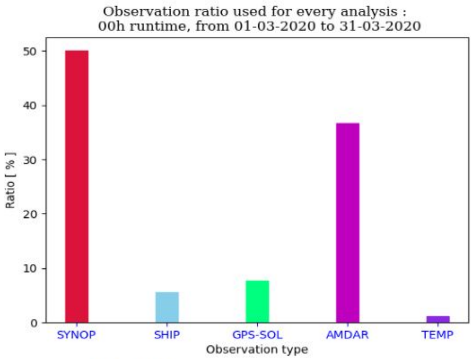
Results presented during the 2021 LACE & DAsKIT DAWD, visio-meeting, Vienna, September 2020

Highlighting… Data Monitoring

Combination of surface CANARI_Oimain with 3Dvar for AROME

Summary about observation usage in arome 3DVAR+canari

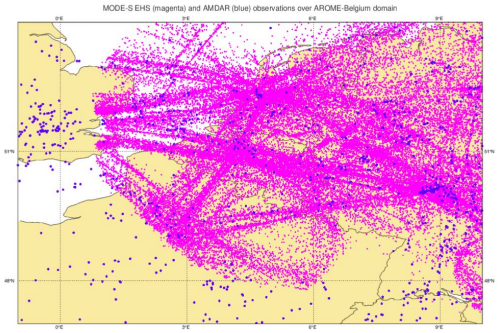
Observation type	Average	• Assimilated parameters
SYNOP/SHIP	~ 300 – 350	• T2m, h2m ,V10
AMDAR	~ 150 – 250	• Upper-air U , T
TEMP	~ 3 – 6	• Upper-air U ,T and H
GPS-SOL	~ 60 – 70	• Zenith Total Delay (ZTD)



DAsKit Working days , Vienna September 2020

Introduction of Mode-S EHS assimilation for AROME

Data collection : ATC radar at "Shiphol airport", Netherland
Data provider : KNMI
Observation frenquency : every 15 min
Observation format : BUFR

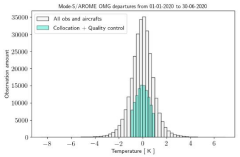


Mode-S EHS and AMDAR coverage over ALARO1.3/AROM-Belgium domain

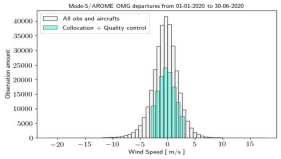
Introduction of Mode-S EHS assimilation for AROME

Before using the Mode-S :
-The routine bator_decobufr_mod.F90 was modified to read the upper_air temperature directly from the BUFR file and write it in the ODB.

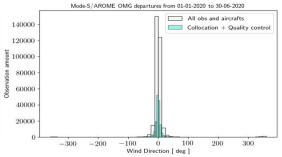
-The observations was monitored during 6 months period (01-01-2020 to 30-06-2020)



Temperature OMG departures



Wind speed OMG departures



Wind deirection OMG departures

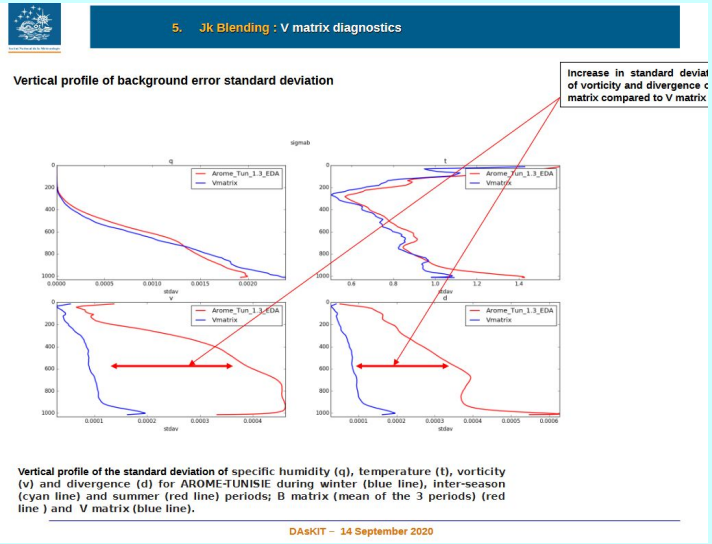
-The impcat of Mode-S assimilation is one of the future perspectives at RMI

Results presented during the 2021 LACE & DAsKIT DAWD, visio-meeting, Vienna, September 2020

Highlighting… Local optimisation studies

Sahlaoui Z, Mordane S, Wattrelot E, Mahfouf J-F, Improving heavy rain forecasts by assimilating surface precipitation in the convective scale model AROME: A case study of the Mediterranean event of November 4, 2017. Meteorol Appl. 2020; 27:e1860. https://doi.org/10.1002/met.1860.

Fatima Zahra Hdidou, Soumia Mordane, Patrick Moll, Jean-François Mahfouf, Hassnae Erraji & Zaineb Dahmane (2020) Impact of the variational assimilation of ground-based GNSS zenith total delay into AROME-Morocco model, Tellus A: Dynamic Meteorology and Oceanography, 72:1, 1-13, DOI: 10.1080/16000870.2019.1707854.



Jk Validation blending to overcome the sparseness of observation on Tunisian domain

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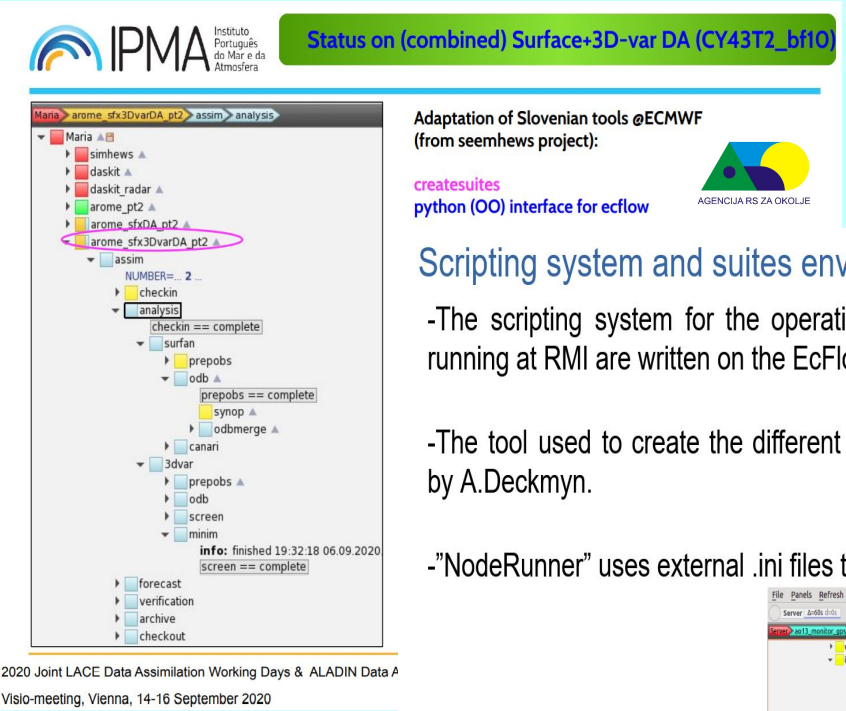
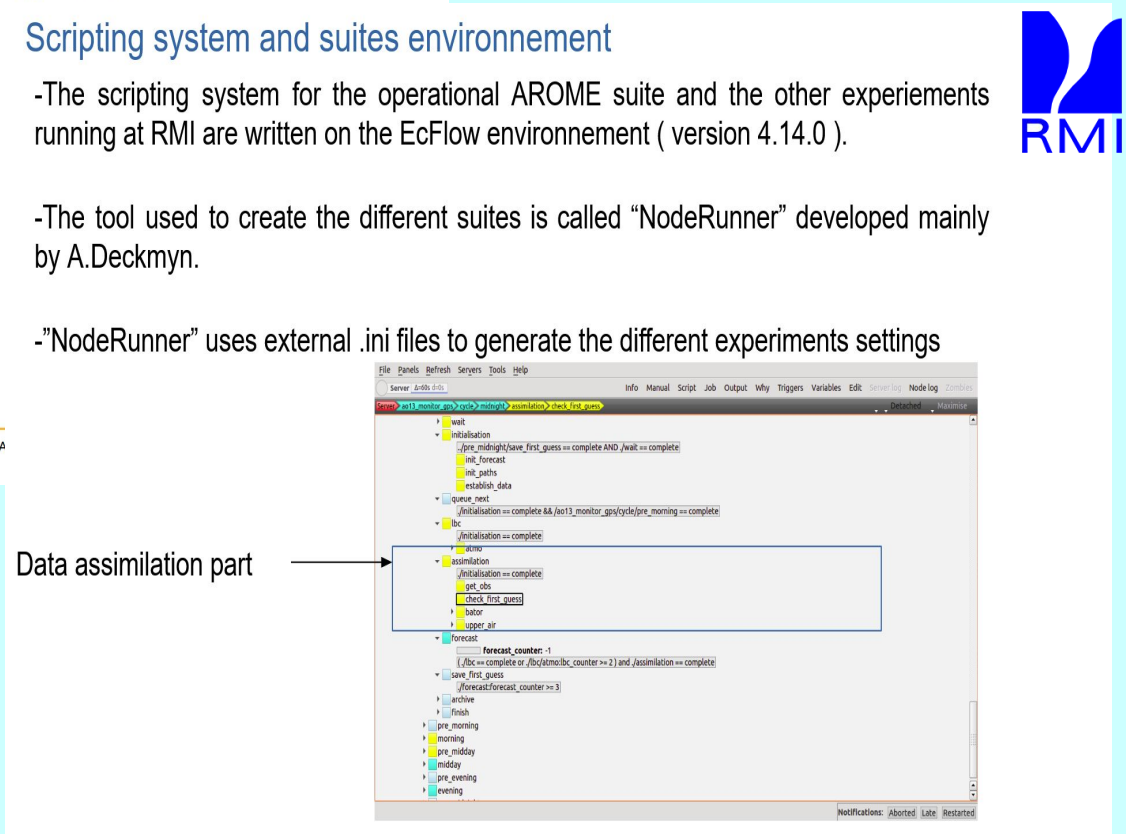
Further progress: workflow

Sharing DA workflow based on an ecFlow (ECMWF) scripting set





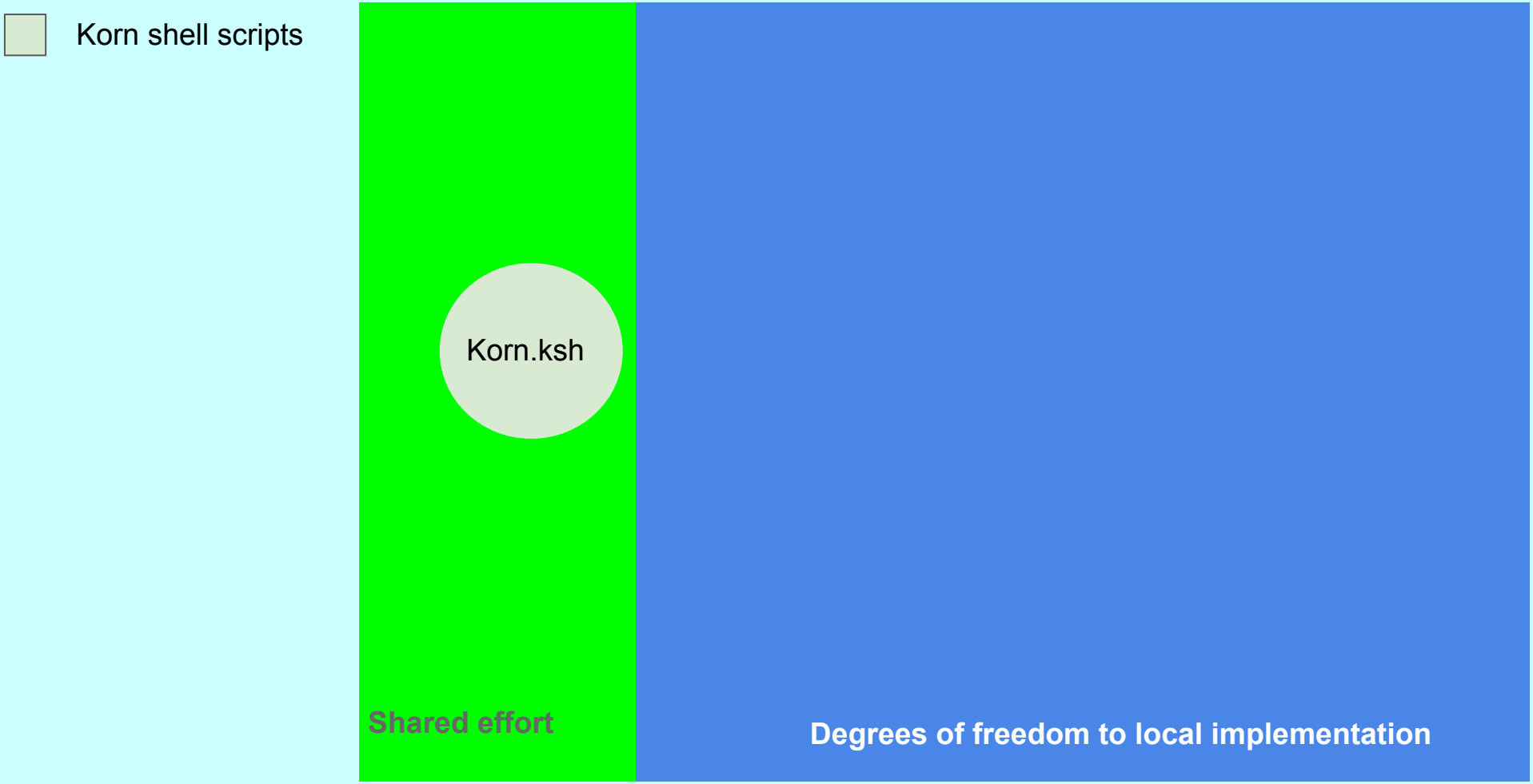
! Announcement

All the countries seem to be willing to move to an ecFlow solution based on Python objects, therefore a prototype should be release soon !

To become extensive to B-matrix computation ...

Further progress: workflow

Enhancing workflow sharing by increasing the common scripts effort



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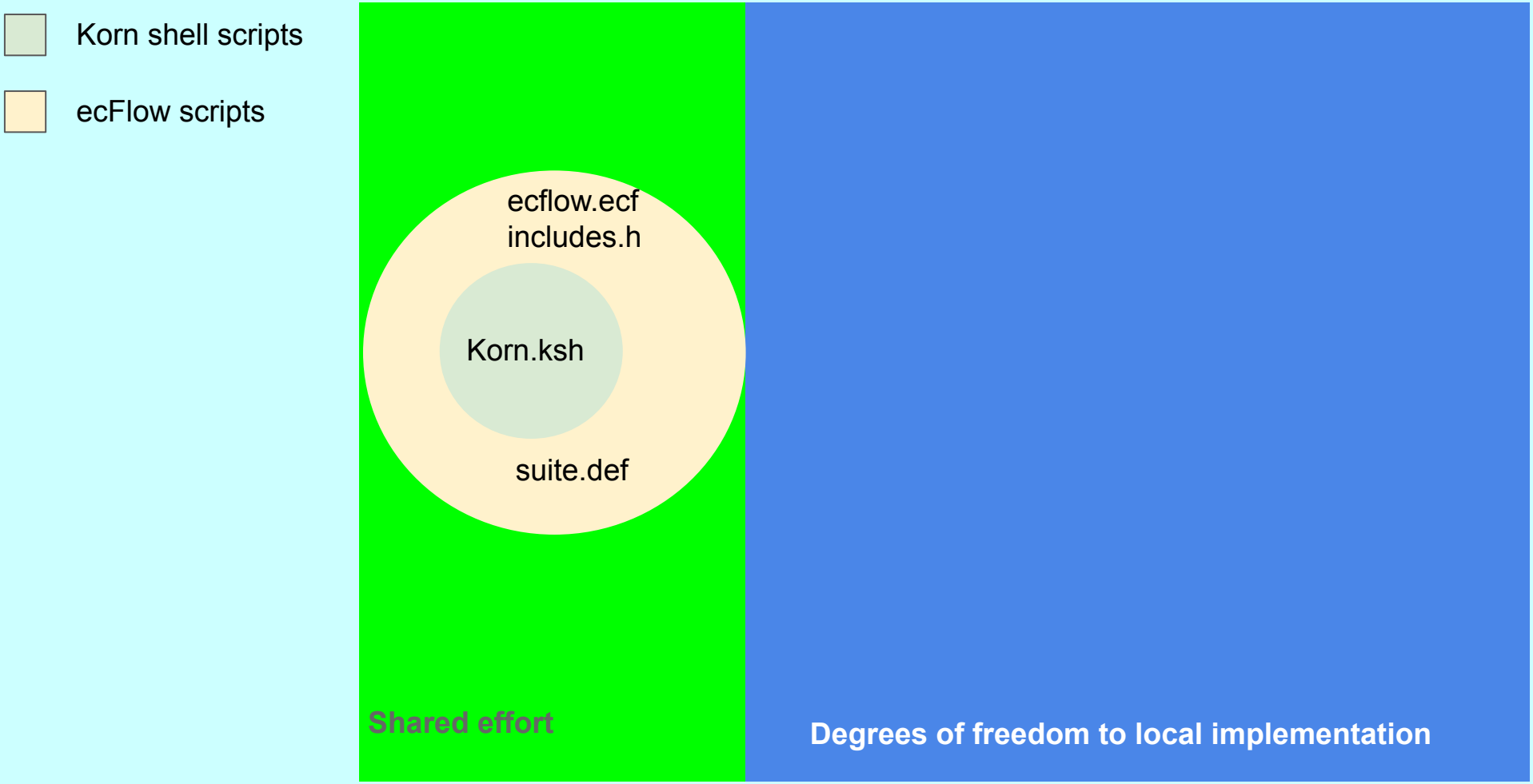
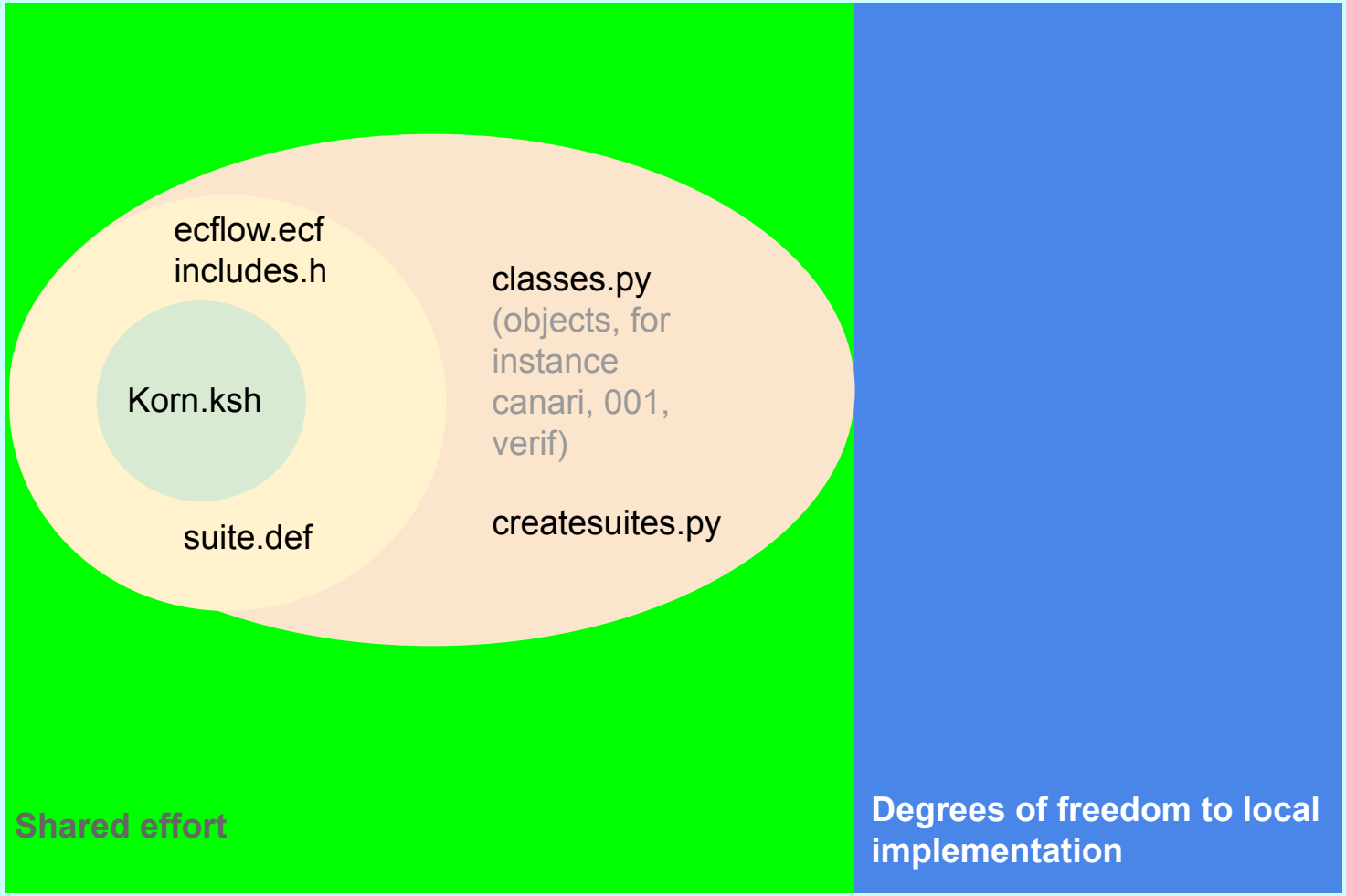


Further progress: workflow

Enhancing workflow sharing by increasing the common scripts effort

- Korn shell scripts
- ecFlow scripts
- ecFlow objects + generator



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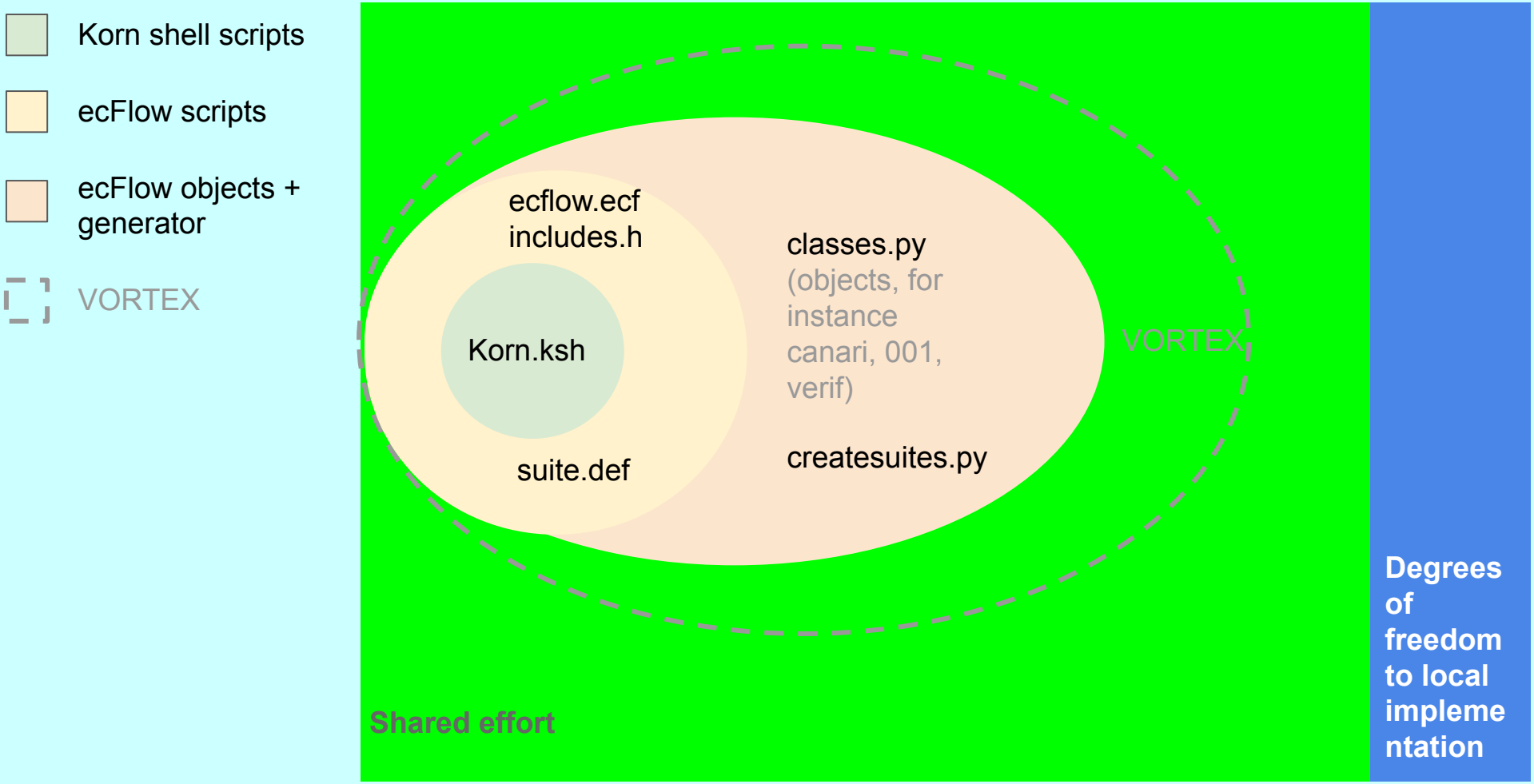

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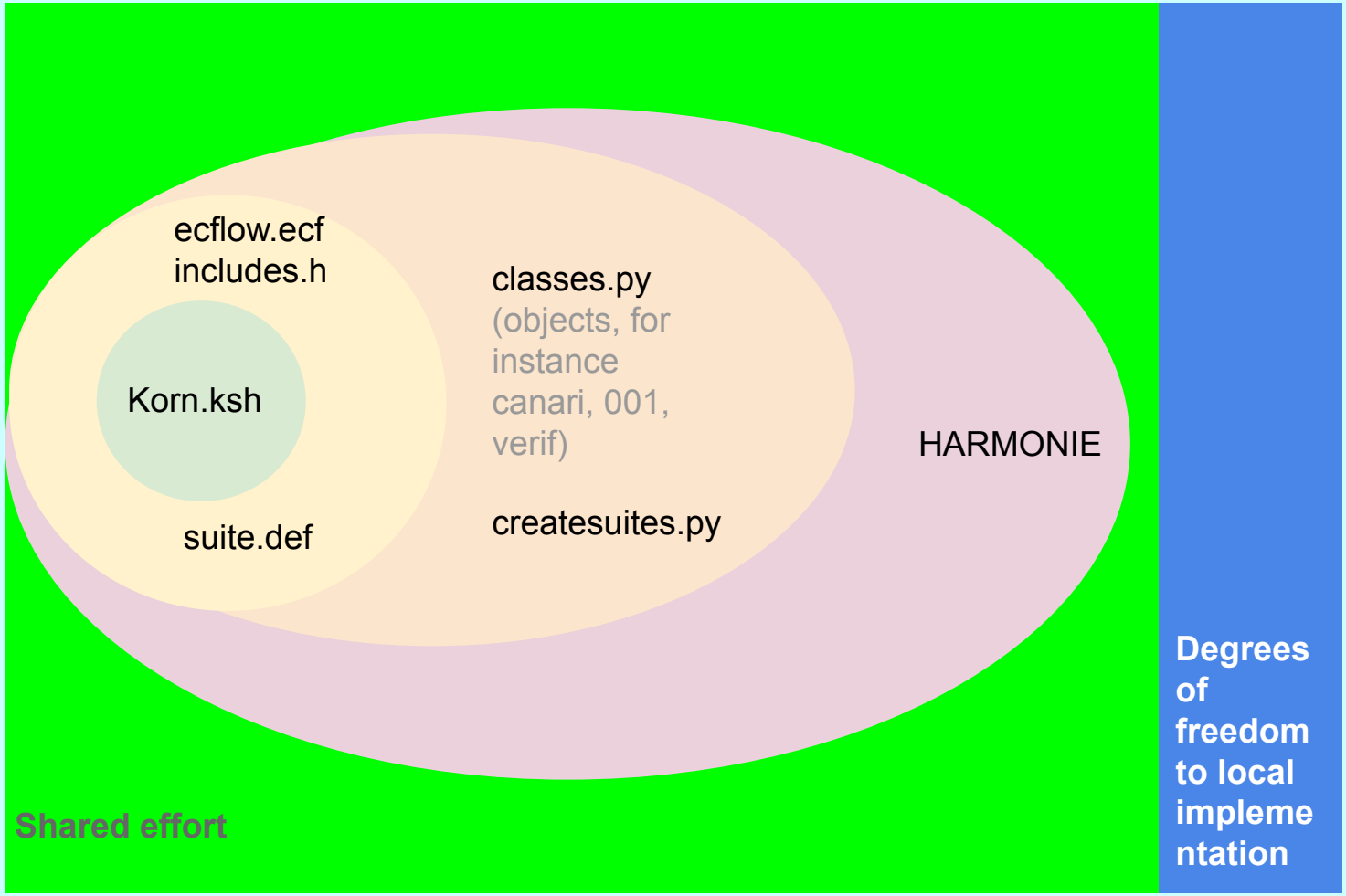

Further progress: workflow

Enhancing workflow sharing by increasing the common scripts effort

- Korn shell scripts
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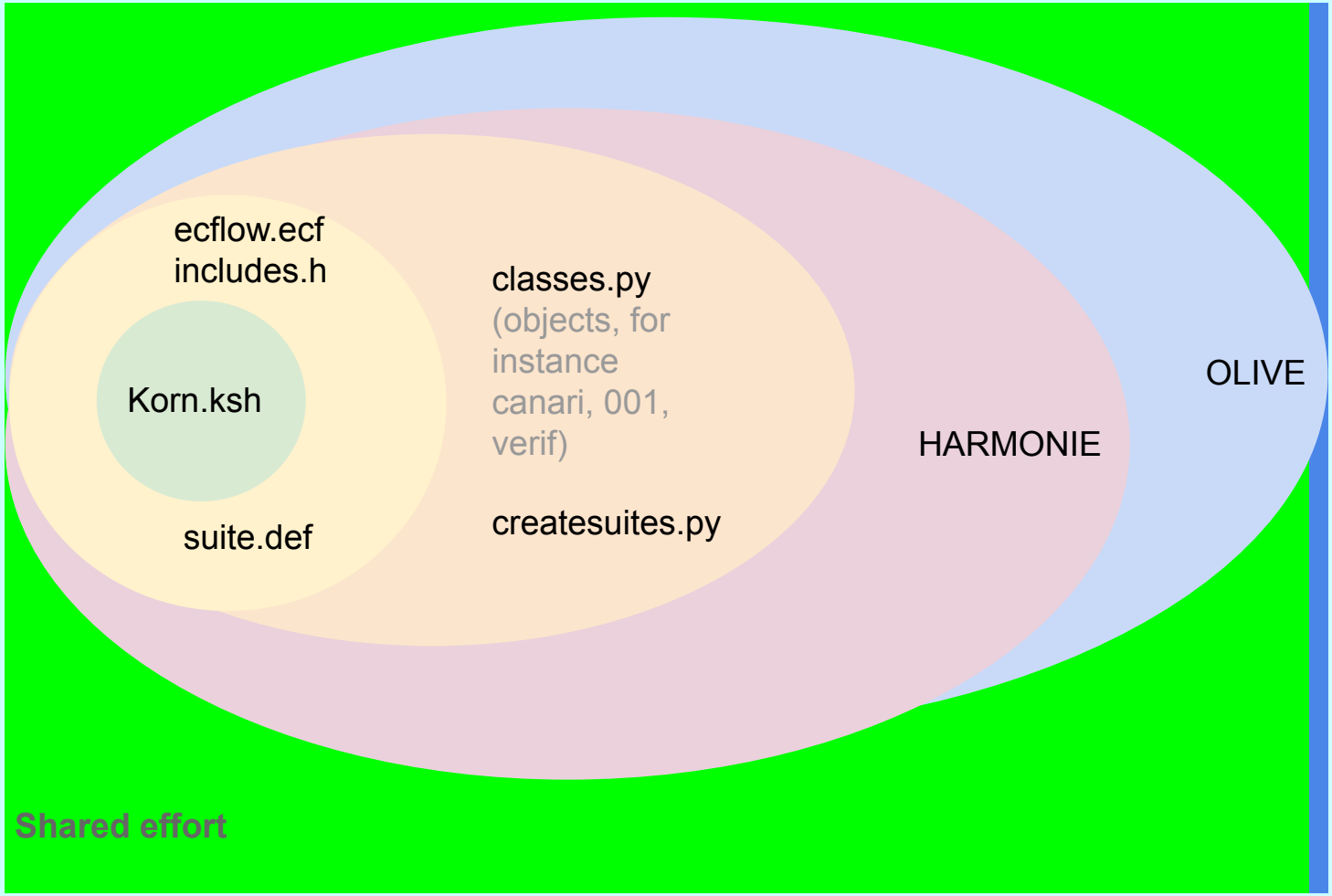
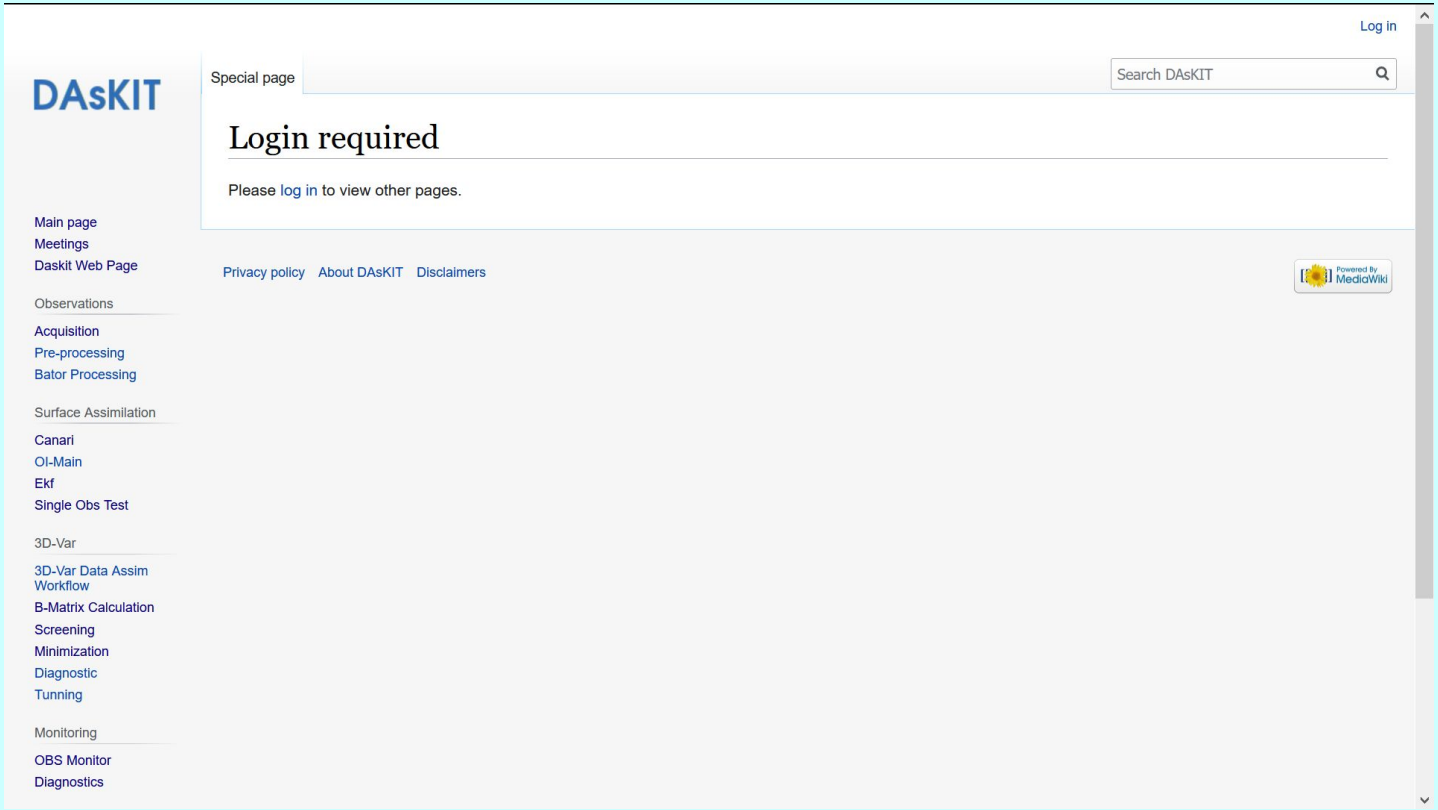
- ecFlow objects + generator
- HARMONIE
- OLIVE



Further progress: communication

Enhancing communication through DAsKIT wiki page



! Announcement

The countries are willing to take advantage of a shared wiki page kindly created and maintained by TSMS. The edition is now on-going taking advantage of DAsKIT programme work.

See next presentation by Yelis Cengiz
Or contact: ycengiz@mgm.gov.tr

Summary

2020-2021 (done !)

- + *Participants are now able to use OBSMON with the T-codes*
- + *Participants are now able to ingest SAPP SYNOPs in their DA systems; but !!!*
- + *A new pre-processing tool PoP-RMI to pre-process WMO GTS BUFR is being maintained for the participants which do not have access to SAPP*
- + *Improved sharing: ALL participants moved to CY43T2*
- + *DAsKIT testbed was upgraded to combined DA at CY43T2*
- + *RMI implemented in operations the surface DAsKIT*

2021-2022 (wishful thinking !)

- + *More countries cycling CANARI-OI_MAIN + 3D-Var ...*
- + *Share the ecFlow scripts plus Python objects&suites generator with possible extension to B-matrix computation*
- + *Proposal for a Task Force on B-matrix computation (Yelis, Alex, Idir, Oauli, Fatima, Wafa, Maria with collaboration of ARSO, ZAMG, CHMI and Météo-France)*
- + *Populate DAsKIT wiki; with the proposal to include all sort of on-line training (Budapest training/dedicated sessions on practical topics/DA seminars/...)*
- + *Getting involved in further ACCORD topics (contribute to OBSMON development; contribute in to a verification tool that may support all types of observations)*

Summary

Thank you for the attention !