



# Dynamic Days 2019 ALADIN/HIRLAM

## Day's objective and agenda

28.05.2019

# Why do we need to care about dynamical core ?

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- Necessity to adapt to new computers' architectures
  - Many nodes/many cores (scalability)
  - GPU
- Improve model weaknesses :
  - Steep slopes
  - Necessity to compute grid-point derivatives for physics parameterizations
- Adaptation to new softwares
  - Atlas
  - New dyncores from ECMWF

# Rolling workplan concerning dynamics

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Aim : scientific discussions about the rolling workplan concerning dynamics

“ The present dynamical core of all three CMC's is spectral, with semi-Lagrangian advection and semi-implicit time stepping. The core program on dynamics and scalability describes the research on the longer-term evolution of this dynamical core (and the possible need to replace large components of it), which may be required to ensure continued good performance (meteorologically and computationally) in the future :”

- ▶ The development and assessment of an alternative quasi-elastic, formulation of the model equations, believed to be more stable for steep orography conditions at high model resolution (WP CPDY1).
- ▶ Assessment of gridpoint alternatives (more stable and less demanding in global communications) to the spectral solver (WP CPDY2)
- ▶ Assessment of HEVI schemes as alternative (less demanding in communications) to semi-implicit time stepping (WP CPDY3)
- ▶ Physics-dynamics interface (WP CPDY4)
- ▶ Development of LAM components in the Atlas data structure framework (WP CPDY5)

“ The dynamics activities outside the core programme deal with shorter-term studies and adaptations of components of the existing core :”

- ▶ lateral boundary treatment (WP DY4)
- ▶ time stepping (WP DY2)
- ▶ discretization (WP DY3)
- ▶ semi-Lagrangian advection (WP DY4)

# Agenda

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- 09:00 Day's objective and agenda
- 09:10 Fabrice Voitus : Equations : new formulations and stability
- 09:40 Pierre Bénard : a Future for the global model ?
- 10:00 Petra Smolikova & Jozef Vivoda: On going activities around dynamics in LACE
- 10:20 Daan Degrauwe : grid-point solvers
- 10:40 pause
- 11:20 Thomas Burgot : What can we expect from grid point AROME ?
- 11:40 Christian Kühnlein : Challenges and evolutions of the IFS core and porting aspects
- 12:00 discussion
- 12:40 lunch break
- 14:00 Colm Clancy : Dynamic research in Hirlam
- 14:20 Philippe Marguinaud : What can we expect from GPU ?
- 14:50 Daan Degrauwe : Atlas
- 15:10 discussion
- 16:00 end