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Strategic issues: BRAC-HR report and follow up,
2011 planned workshop

Report from the PAC meeting
3-4 June 2010
Bucharest

Brač-HR Strategy dilemma

- Ideally we would already know what problems to address scientifically within 5 to 10y, but we don't.
- The discussions in Brač pointed to 2 drastically different proposals:
 - The problem is in the **dynamics**: we need a gridpoint dynamical core. The proposal is to include the AROME physics in a higher-order runge-kutta dynamics, see lower right box on the next slide.
 - Address the problem by improving our scientific understanding of the gray zone **physics** problems and develop the tools to handle them, i.e. continue with what we were doing in the upper left box on the next slide.

Spectral, SI SL ↔ Local (gridpoint, FE), Split explicit, Eulerian

Estimate: 10 years of development

Scheme of the tests

ALADIN NH dynamics (spectral)

ALARO physics package.
FOCUS on a parameterization
toolbox: deep convection, SLHD,
3D turbulence, stochastics...

ALADIN NH dynamics (Spectral)

AROME/meso-NH physics: no
deep convection parameterization

Runge Kutta dynamics (local)

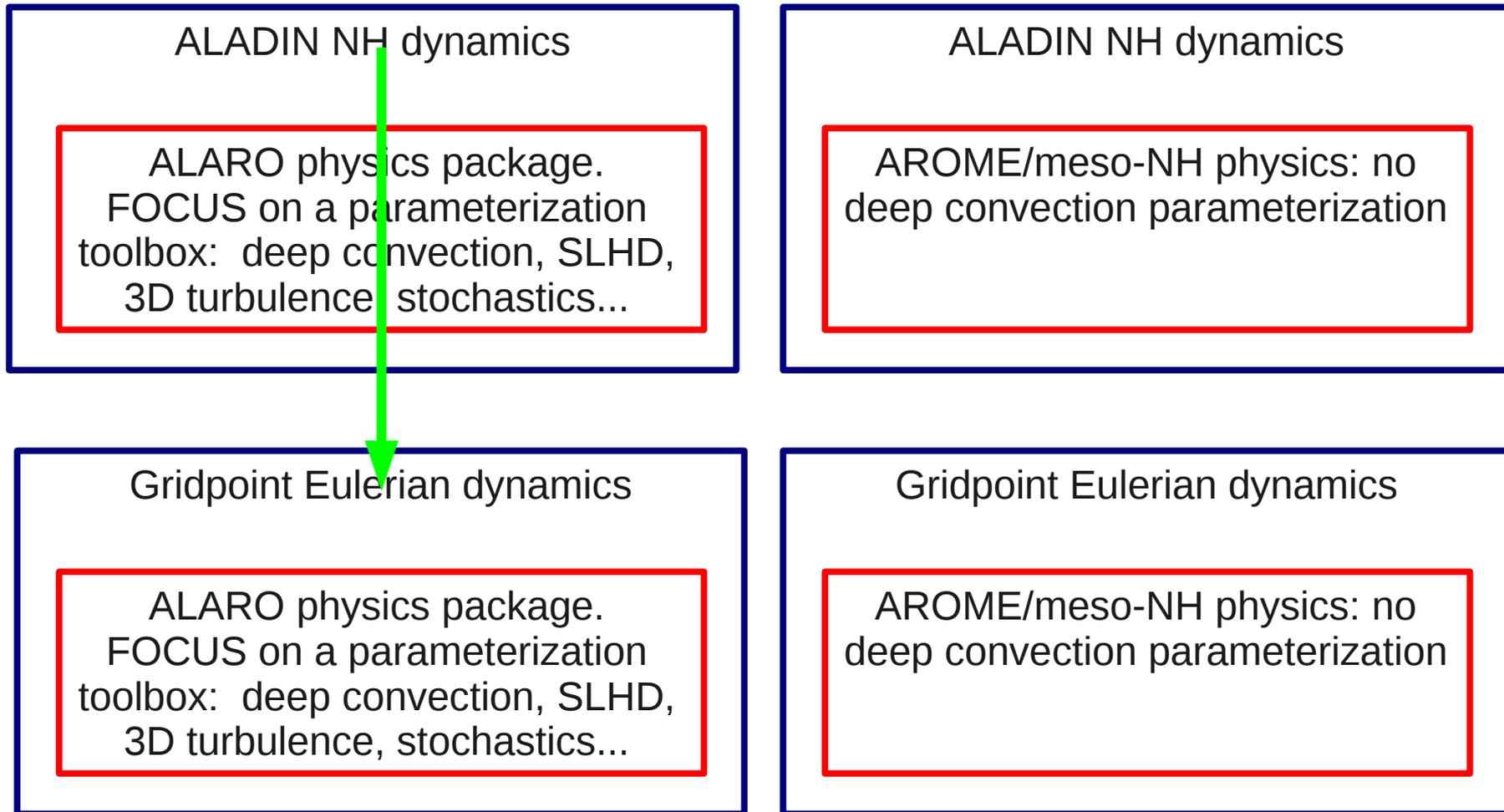
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Runge Kutta dynamics (local)

AROME/meso-NH physics: no
deep convection parameterization

Impossible: no physics-dynamics interfaces!!!

Question: is it possible to follow the green arrow?



At each stage one can fall back to the old scheme

Questions for PAC6

- Remark: scalability is a crucial future goal. All scientific proposals should be tested with respect to scalability.
- Do you agree with the strategy of scientific dealing with the issue of the deep convection, i.e. develop a variety of tools to address the unresolved processes? **YES/NO**
- Strategy is a bet: should we take a huge leap, reorganize the code, or rather progressively build on what we have today, or any combination?
- Should we make an effort to strive for replacement tests as much as possible (this does not exclude that production tests, and academic tests are needed!)? **YES/NO**
- If we have an agreement on the above three points how do we substitute for the unfortunately lack of bargaining between the 2 extreme positions during the Brac meeting?

Bridging action

- There exists also a need to provide input to the follow-up workshop of Brac-HR in order to harmonize short-term and longterm strategies.
- This should be done jointly by HMG and CSSI. It was proposed to take two members (on basic dynamics and on physics, given the issues at stake) on each side (PB, FV, ST and MH). Additionally it is important that this work is followed closely by PAC and proposes two watchdogs (RB and PB).

Digest of the PAC analysis of Brac-HR (1/2)

(PM and PAC-Chair)

In short, PAC:

- Recognises the value of progressive development (concerning issues with strong potential for either bifurcations [e.g. dynamical core] or half-competing / half-complementary solutions [e.g. simulation of convective motions]). Use of a strategy of 'replacement tests' (like in the example of the late position paper to Brac-HR submitted by the HIRLAM and ALADIN PMs) should be a key tool for that, without excluding the use of other types of tests in well targeted circumstances.
- Asks that positive aspects of the Brac-HR outcome which are on the right time scale should find their way towards the 2011 Workplan (plan to be common this time to ALADIN and HIRLAM).

Digest of the PAC analysis of Brac-HR (2/2)

(PM and PAC-Chair)

(In short, PAC):

- Insists on scalability becoming a transversal concern in all related scientific matters.
- Would like to see the many issues (some of them probably critical for future progress) currently loosely defined under Physics-Dynamics Interaction (PDI, *not meaning here any more Physics-Dynamics Interfacing*) being treated in a more coordinated and hence more constructive way.
- Asks a group composed by the respective members for 'dynamics' and 'physics' of both HIRLAM Management Group and ALADIN CSSI to prepare proposals in view of making up for the absence of consensus at Brac-HR on issues related to their area of competency, on the basis of the above statements, when appropriate.

Between PAC6 and PAC7

- The group was established, started to work steadily after a 'kick-off meeting' with both PMs, at the occasion of EWGLAM (4-7/10)
- It exchanged a lot of information and met again at the occasion of ECMWF's workshop (8-10/11)
- It produced some input for the discussion of PAC7

PAC's action at its seventh Session

- PAC welcomed the provided information, found it useful for the targets the group had chosen (overall efficiency and already feasible actions) but of insufficiently large scope.
- The reasons for this were debated with some feeling that the 'shadow' of Brac-HR might still have been too pregnant on the WG's work.
- PAC recommended pursuing the effort by:
 - Adding contacts with architecture pure specialists;
 - Stratifying the work in:
 - Immediately needed actions;
 - What would have to be done for future architecture at unchanged equations and basic discretisation choices?
 - Scientific watch on the debate about 'optimal' choices for the dynamical-core in the future.
 - Documenting the work more in a work-plan way.
- PAC didn't consider the 'phys/phys-dyn' aspects. GA may!