

# WORKSHOP ON PHYSICS, Prague, 16/9-4/10/2002

## Participants

Jean-Francois Geleyn (Meteo-France) – teacher  
Martin Bellus (SHMI), Martin Janousek (CHMI), Alexander Kann (ZAMG), Laszlo Kullmann (HMS), Richard Mladek (CHMI), Harald Seidl (ZAMG), Petra Smolikova (CHMI), Kay Suselj (Environmental Agency of Slovenia), Alena Trojakova (CHMI), Martina Tudor (Croatian MHS), Filip Vana (CHMI)

## Aims and reasons to organise it

During the discussion about the new organisation of research in the framework of the future RC LACE structure on SAC meeting in Vienna (fall of 2001) first time appeared a call for organisation of common action oriented to model physics. This at the time a bit foggy proposal was further clarified by an ensuing e-mail discussion. Consequently next SAC meeting in Budapest (spring 2002) agreed to simulate the future working group structure of LACE research through establishing a WG on physics. T. Haiden was asked to organise and coordinate this action. It was also agreed that a good start for this would be a kick off action organised within the current LACE research rules. In contrary to these decisions the discussion in Medulin (ALADIN workshop, June 2002) led to a conclusion that no special action for physics is needed. There the research in physics was oriented into three directions, the two first ones with rather middle term outcomes:

- The new revision of the whole ARPEGE/ALADIN physics according ambition proposals of Luc Gerard;
- EUROCS-type research of Toulouse people (EB, JMP,...).
- Work on the two bottlenecks of the shallow convection parameterisation and of harmonisation of the two types of precipitation.

Distributing the "physic" people into these three groups, with the third part more or less left to LACE individual people, no one remained for the smaller less ambitious but more urgent jobs appearing during the operational experience of the model. Hence the idea to come up once again with some kick off action within the LACE community started to be once again actual. Finally it was decided to organise such action during three weeks in September-October 2002 in Prague at the time, when most of the LACE physic people were able to come there. Of course, the aim was also to introduce newcomers into this difficult part of NWP. A hope, that it helps to create a third centre of physical research within the ALADIN community was also expected as the outcome of this action.

## The workshop

The program of the workshop was very ambitious. The participants attended a set of general lessons about the NWP physics and special ones about the parameterisations used in the ARPEGE/ALADIN. Each participant then reviewed a certain physical code and compared it with the existing documentation. Everyone had been also self studying some physically oriented article (at least one) about which there was then reporting. Small subgroups (2-3 people) were established to work on some physical mini-topic. The same subgroups were also investigating one malprediction of operational application for the precipitation over the Mediterranean sea from different points of view. Finally participants were separated into two groups with the aim to start a bit more serious research in the physics, along the lines of the third Medulin line of action. Most of this actions were performed simultaneously. It just illustrates the fact that the program was quite dense.

## Conclusion

Mainly due to many different tasks for every participant and necessity for work in parallel, the most ambitious work (the research action in two groups) have not brought expected effect. Since everybody was quite overloaded by other duties, the common work was covered with lesser priorities. This on the other hand nicely demonstrates, that common work is impossible once the engaged people have other duties (which is the case for most of the people being home in their services). Since most probably to have a group of people fully devoted only to research is just a dream, at least there should be some leading person of the particular research topic, with not many other duties and some power over the other engaged people to keep them working within the group. As the scientific conclusion both groups independently demonstrated that implementation of the internal downdraft in the cloud is the very hot topic for the current ARPEGE/ALADIN physics. This logically raises the need for some action to cure this weakness. Three possibilities were proposed during the final debriefing

1. Let this topic for someone going to work on physics.
2. To work further on this topic at home as a group (keep in touch, exchanging ideas, distributing work...).
3. To organise another action like this in near future.

The point 1. is most probably the solution of this outcome (Doina Banciu will most probably do it during her stay in Toulouse), but this is far from some common research action which was one of the aims when organising this workshop. Thus it was not the intention to end in such solution. The point 2. is under the framework of the current LACE research structure too idealistic and thus impossible. At least until some leader with more power to activate the others would be established. (Of course a mechanism allowing the other researchers to participate to a common action is also a need.) The last point 3. is also not possible before the new LACE research rules will be defined. Moreover even when the proposed research structure of WG will allow similar actions, to organise such workshop requires some administrative planning strategy which is not enough flexible to solve physical problems completely.

Area of research	Main topics	Actions
Use of new prognostic variables	Convection	Investigating problems in the triggering of convection Analysis of the closure and hysteresis problem
	Microphysics	Introduction of a semi-complex microphysics Interface with convection
	PBL + low level clouds	TKE scheme Link between top of PBL fluxes and cyclogenetic activity Shallow convection PBL-height dependent mixing lengths Tuning of the anti-fibrillation scheme
	Radiation	Refinement of optical depths Development of an intermediate scheme

Improvement of basic parameterisations	Orography	Better description of roughness length Investigation of feed-backs with other parameterisations
	Surface	Parameterisation of lakes Revisit of $z_0h/z_0m$ ratio
Interaction with the predictor-corrector approach		Medium / May be
Validation	Case studies	Identification and study of «strange behaviour» cases
	New methods	Design of new scores or criteria