Tentative road-map for the lectures during the TCWGPDI event (Prague, 22-26/11/04)
DRAFT N°1

Reminder :

Introduct.	A1 (JFG)	A2(SM)	B1(JFG)	----------	A3(MT)	B2(PT)	C1(MH)
A4(BC)	WG-A	B3(PT)	C2(BHS)	----------	E1(GH)	B4(MT)	WG-B
C3(YB)	D1(MH)	C4(GH)	F1(MH)	----------	C5(SM)	WG-C	D2(JFG)
WG-D	E2(BC)	WG-E	F2(GH)	----------	WG-F	G1(BHS)	H1(AT)
G2(JFG)	H2(FV)	G3(BHS)	WG-G	----------	----------	----------	----------

A) Equations

1) Basic parameterisation notions; how to go from the 'particle equations' to the parameterisation constraints?
2) The AROME choice for the basic set of equations.
3) Which link with the current ARPEGE/ALADIN equations (**Remark**: some Meso-NH and HIRLAM equivalents may be inserted in the programme, if relevant).
4) The integrated treatment of the water phase changes and precipitation processes under several high-level options.

B) Stability and reliability of physical schemes

1) Basic relevant rules of numerical analysis.
2) Literature review (Cayla et al., Staniforth et al., Wedi, …).
3) Strategy for AROME and associated projects.
4) The specific cases of stiffness and/or non-linear instability in the vertical. Results with ARPEGE-ALADIN (and AROME/Meso-NH ?).

C) The 'bottom up' constraints (IFS, HIRLAM, ARPEGE, ALARO, AROME-Meso/NH)

Those constraints are the existing one (mostly for historical reasons, sometimes for more advanced thinking) that make the call of physics routines rather model dependent and that require therefore special thinking when designing new rules. One good example is the one of the humidity convergence (for the convective closure) in the present ARPEGE/ALADIN situation: it has to be done in an Eulerian way (because of the order of the various calls) and hence requires a spectral treatment of the q variable which is al right nowadays; but, when going to a detailed microphysics which rather calls for grid point moisture values, it will probably need to be adapted via an extra passive variable q_total treated spectrally just to deliver horizontal derivatives. Less complicated constraints come from the need to transfer information from one time-step to the next or from the change of vertical coordinates between Meso-NH and the remaining contexts. **Everyone of the five speakers on this topic (the correspondence with the list of models is obvious) is expected to make a detailed survey with its specialists before preparing his/her talk.**

D) The 'top down' constraints

Opposite to the previous ones, these are the constraints one thinks necessary to impose if one wants progress in portability and eventually capacity to externalise (externalisation should in principle mean modularisation).

1) The IFS view.
2) The A-A-A-A view (with input from HIRLAM to the speaker prior to the meeting, if appropriate).

E) Code architectures and organisation of the time step

1) Some revisit of the basic IFS/ARPEGE/ALADIN/AROME data flow and associated subtleties.
2) First ideas on how to reconciliate tendencies and fluxes, on how to allow both sequential and parallel calls to the physics routines, etc.

F) Externalisation and/or portability (under Integration-Flexibility-Modularity-Generality constraints)

1) The ECMWF view and long term schedule
2) The practical example of the AROME prototype: advances and hurdles.

G) Constraints of the HIRLAM and ALADIN-2 collaborations

1) The HIRLAM view, on its own stand point.
2) The ALADIN-2 view.
3) The additional HIRLAM constraints for an AROME-oriented convergence (in physics only, of course).

Remark: these lectures should best be prepared (or at least updated) 'on the fly' during the week in order to benefit from the previous discussions and Working Group sessions.

H) Other links with the dynamical part (NH and 3D aspects)

1) The question of the projection of diabatic heating in a fully compressible model; what goes to 'T', what goes to 'p'?
2) Semi Lagrangian Horizontal Diffusion (SLHD) as example of the possibility to use the 'stay' in s.-Lag. space to do non-linear 'local' calculations.