Intermediate stage analysis of the WG on 'microphysics'

- Two potential 'scientific' discrepancies have been identified on top of the already known more 'technical' ones:

  – Given the joint ('resolved' + 'convective') condensation feeding, a 3MT input state to microphysics will not be 'balanced' in the thermodynamic sense. One does not know whether it matters. But, if necessary, it can be circumvented (the temperature input to APLMPHYS is 'unconstrained' by the 'cascade', an option already exist to modify it, a second one could be added).

  – In ICE3, there is no intra-time-step interaction between sedimentation and other processes. Introducing of a PDF-based sedimentation computation hence does not allow a more realistic behaviour at long time-steps (the scheme remains intrinsically 'Eulerian' because for instance 'collection' is still 'auto-collection'). Hence, it is not only the (necessarily differing) order of the computations that might make the 'physical' results of ICE3 becoming unrealistic under a '3MT' call (or any call with a true 'Lagrangian' scope), but rather this limitation.

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- The 'selective externalisation' of ICE3 processes would be technically rather easy but would require 'one routine per process':
  - Since the ICE3 process computations are one by one outside any explicit vertical loop, adding a set of 'calls' will preserve identity on the Meso-NH side and allow a stand-alone use on the 3MT side.
  - But the said calls would be of minimal scope because they must exclude the existing calls to diagnostics done after each process.
- The forthcoming start of work on a (rather radically different) two-moment scheme in Meso-NH makes the situation more delicate:
  - The interest of the GMME team for interacting with an 'externalisation' effort in order to try and benefit from a 'Lagrangian-type' enhancement is limited.
  - Not yet knowing what will be the technical characteristics of the scheme from which the new work will start, it is impossible to assess whether it would be a good candidate for another 'attempt'.
  - This touches issues not limited to the 3MT side (personal opinion).

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- Concerning the 'APLMPHYS in ARPEGE' issue:
  - The ALARO-0 side will code a solution that both complies to the existing 'sub-grid' data flow and emulates the ARPEGE situation (without CPU saving).
  - Even if one cannot expect any big practical impact, the ARPEGE solution for the final flux-computation will become a transversal option and the correction of the small conceptual bug discovered by Yves Bouteloup for the current situation will be performed.
  - Yves will start a 'paper' study for relaxing the ΔZ_{eff} computation technique towards something more APLMPHYS-compatible.

- The WG did not have time to evaluate the manpower side of all the above, but its findings probably first need a 'political evaluation' of the plenary