

**Run3+4 Simulation:
feedback from PWG-LF**

on behalf of the PWG-LF coordination crew

ALICE software and computing week

Run 3/4 Simulation Planning

1.) How is the current ratio MC/data motivated ? How would it ideally evolve for Run3/4.

Most of the LF analyses do not use General purpose productions with the exceptions of:

- kink analyses for which high statistics is mandatory
- template for nuclei analyses: estimation of secondaries due to spallation processes
- HMPID analysis in the SPECTRA PAG

Analyses in the STRANGENESS, NUCLEX and RESONANCES use MC productions with injected signal.

In general: Low-intermediate pT phenomena are well covered by **current sample sizes** (i.e. we really do not need a fixed MC/data balance). Analyses of high pT processes will use simulations with embedding in Run3&4.

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2.) Which signal biasing techniques are already used and which other techniques could be used ?

Up to now: injected signal in most of the PAGs and signal triggering from MC

In the future (also near future): Embedding and signal filtering (provided this will not introduce a bias in the efficiencies estimation)

3.) Are there areas where full simulation could be replaced by fast simulation, for example parametric simulation of efficiency and resolution ?

For those analyses reported in point 1.) and for which the general purpose MC is now used.

As examples:

- Analyses using primary tracks (e.g. resonances): parametrization of the resonances efficiencies using as starting point the primary particle efficiencies
- Nuclei: possibly tweak Geant to enhance the spallation processes in dedicated productions

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4.) Do you need full simulation of the background event or could it be replaced by a simplified version (e.g. effect of occupancy only).

At present needed for:

- template for secondaries for pions, protons, nuclei and exotica in the future
- underlying event to have a realistic pT shape for secondaries

5.) Which detectors/secondaries really need to be simulated for your analysis?

Most of LF analyses do not use calorimeters, some analyses with injected signals might disable other (small) detectors (e.g. HMPID for strangeness analyses MC)

Open question: considering that di-muon analyses will be discussed in the PWG-LF, is the simulation of the full barrel necessary for the muon analyses in Run3&4?