ALICE

FEEDBACK FROM PWGS
- PWG-DQ -

Outline:

- Questions to the PWGs
- Full example: PWG-DQ / LMee
- Additional input: JPsiee, Dimuons
- New ideas

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QUESTIONS

- **How is the current MC/data ratio motivated ? How would it evolve in Run3/4 ?**
- **Which techniques are used:**
  - **Injected signal**
  - **Pt hard bins**
  - **Embedding**
- **Can full simulation be replaced by fast simulation ? Parametrized efficiencies or so...**
- **Do you need full simulation of the background event ? Or only effect due the track occupancy**
- **Which detectors/secondaries really need to be simulated ?**

REPLIES: LMEE PAG

- **How is the current MC/data ratio motivated ? How would it evolve in Run3/4 ?**
  - Depends on data sample:
    - pp: 13-100% sampling rate
    - PbPb: even smaller (2M events anchored to LHC15o)
  - Usually we are limited already now by MC statistics (signal efficiency correction), see example plot in backup.
  - For Run3/4 we do not expect this to change significantly, since the plan is to have the efficiency correction much finer bins. Missing a detailed study on this question though.

REPLIES: LMEE PAG

- **Which techniques are used:**
  - Injected signal:
    - LF sources via AliGenParam (pi0, eta, eta', rho, omega, phi)
    - HF sources via Pythia (ccbar, bbar, b)
  - Embedding + signal filtering:
    - Currently tested for 2018 productions (HF injection)
      - Av. running time reduced by 50%
      - Storage reduced by a factor of 4

REPLIES: LMEE PAG

- **Can full simulation be replaced by fast simulation? Parametrized efficiencies or so**…
  - An option could be:
    - single leg efficiencies (less full MC statistics needed) + cocktail
    - this was used in the past for high invariant mass (pp 7 TeV paper), but some problems observed at low invariant mass
  - Another option is parametrized detector responses
    - used for upgrade studies (https://cds.cern.ch/record/2661798): fast simulation tool (FT2)
    - Quite some tuning had to be done before (Johannes Stiller)

REPLIES: LMEE PAG

- **Do you need full simulation of the background event ? Or only effect due the track occupancy**
  - Not with the same sampling
  - Need some BKG event for correlated hadron contamination study
    - not clear how much at this stage

REPLIES: LMEE PAG

- **Which detectors/secondaries really need to be simulated ?**
  - For realistic photon conversion (compare to upgrade studies)
    - Beam pipe
    - ITS (at least inner layers)
  - TOF: might be important as well for mismatch studies

OTHER INPUTS

- **J/Psi to electrons:**
  Similar situation as LMee:
  1) Not MC/data ratio is needed, but a certain number of injected signals such that efficiencies have enough stat. precision (could increase number of injected particles or improve in specific kinematic regions, if ratio is decreased for Run3/4)
  2) Injection used, embedding validated (ALIROOT-7653 and DPG slides of this meeting)
  3) Secondary vertexing would need full simulation/reconstruction
  4) Background event could play a role for secondary vertexing
  5) ITS, TPC, TRD, TOF, V0, T0, ZDC, EMCAL

  Secondaries: Full simulation of the primary electrons propagation in the detector setup (e.g. Bremsstrahlung).

- **Dimuons:**
  - See next slides (prepared by Javier)

NEW IDEAS

- inspired by LHCb/Michael Winn:
  - Fast simulation, but taking matching, PID, … efficiencies from data
  - Redecay: reuse the "background event" and only repeating the decay and the propagation of the decay particles (https://arxiv.org/pdf/1810.10362.pdf)

- Not yet really discussed in PWG, but wanted to mention them here

BACKUP

PAIR EFFICIENCY LMEE – PBPB 2015