ESD clean-up at the physics level (first round)

I. Belikov

- Motivation.
- Implementation.
- Present status.
- Next steps.

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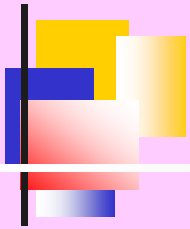


Motivation

Removing from ESD the tracks (and eventually secondary vertex candidates) having little value for the physics analysis is needed for

- reducing the ESD size (about 30% reduction can easily be achieved);
- facilitating the analysis performed at the ESD level and the subsequent filtering ESD ->AOD.

Implementation (1)

The ESD clean-up procedure can be called at two different levels :

- AliESDEvent::Clean(Double_t *prms).

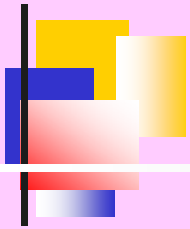
  So that ESD is capable of cleaning itself (read from a file, clean, store in a different file)

- AliReconstruction::CleanESD(AliESDEvent*)

  which can optionally be called at the very end of the reconstruction just before dumping the ESD object to a file.

  This function delegates the execution to AliESDEvent::Clean with the values of the parameters settable by AliReconstruction.

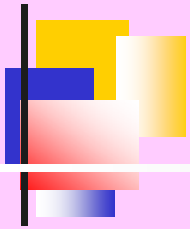
  Currently, two parameters are used: the track impact parameters in XY and Z, with the default values of the cut set to 50 cm (geometrically not inside the ITS, "orphan" tracks).



Implementation (2)

The "first-round" algorithm of AliESDEvent::Clean

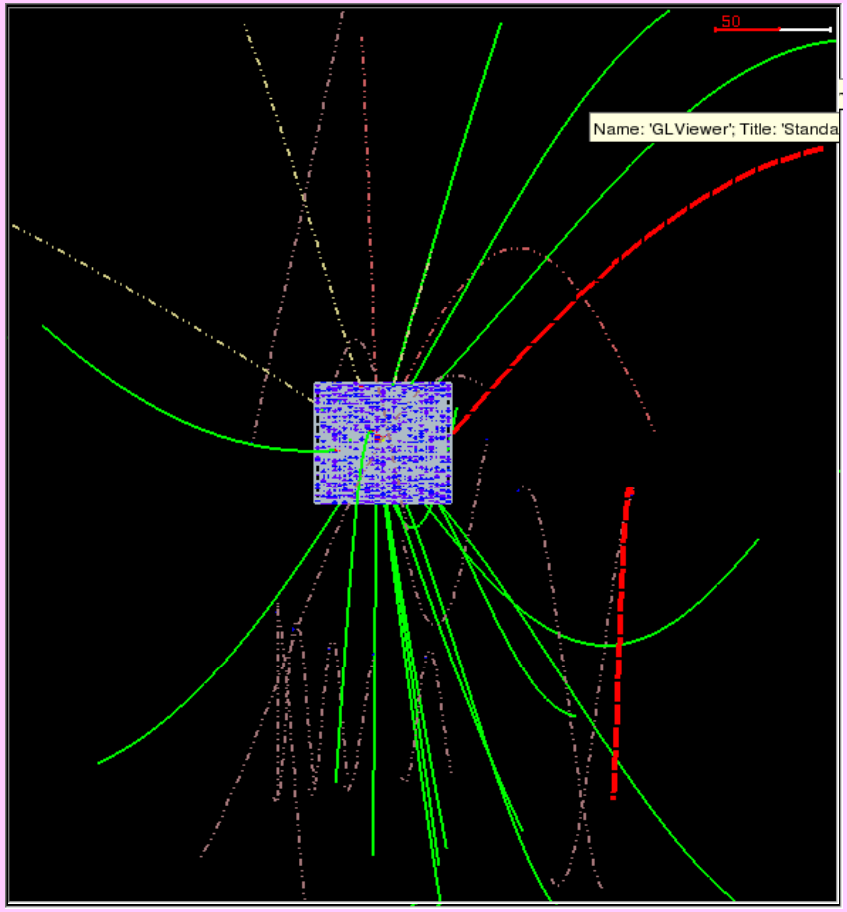
- For each ESD track having at least one of the impact parameters bigger than the cut value (50 cm by default) :
- Check if this tracks is associated with any reconstructed secondary vertex (kink, V0, cascade).
- If it is not, then remove this track from the track TClonesArray, and
- for all kinks/V0s/cascades concerned, remap the indices of the associated ESD tracks (the most delicate part of the procedure).



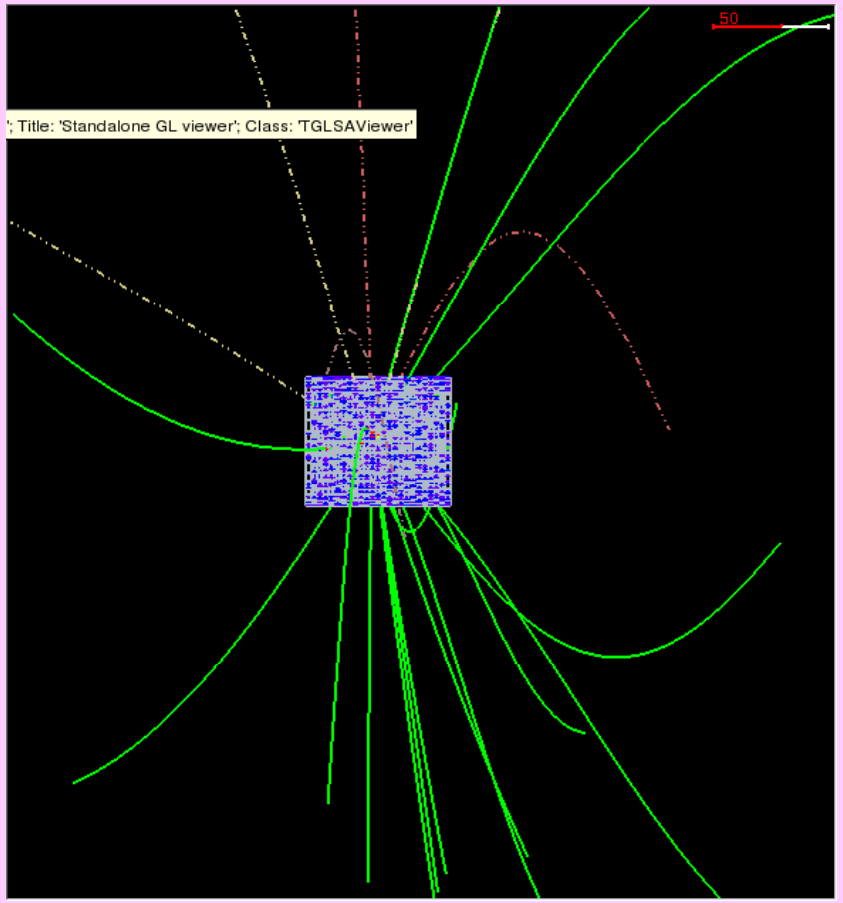
Present status (1)

- The "first-round" implementation of the ESD clean-up procedure gives 20-25% reduction of the ESD size (both, in pp and PbPb).
- Presumably, the reduction factor is bigger for events with pile-up and other yet unknown sources of background (has to be checked).

Present status (2)



Before cleaning
(38 tracks)



After cleaning
(22 tracks)

Next steps

- Revision of the stored kink candidates
  (help from the TPC reco. people is very desirable)
- Revision of the stored V0 candidates
  (help from the ITS reco. people is more than desirable)

Additional gain in ESD size, especially in PbPb, is to come with this "second round" due to

- reduction of the number of stored V0 candidates,
- a possible releasing of a certain number of "orphan" tracks.