Physics Coordinator Communications

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SPD Physics & MC
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1-st stage forms

- 15 (19) form were sent Evgeny Soldatov as well as to me and Amresh. If somebody hasn't sent it yet, please do that!
- The forms are to be discussed at the SPD 1-st Stage Group Meeting.
- A few remarks remarks:
  - the **luminosity** is often overestimated (you may provide the needed integral luminosity)
  - many analyses **miss simulation** for feasibility study
  - PID **performance** of SPD is often overestimated (dE/dx performance plots are in TDR)

Available production data

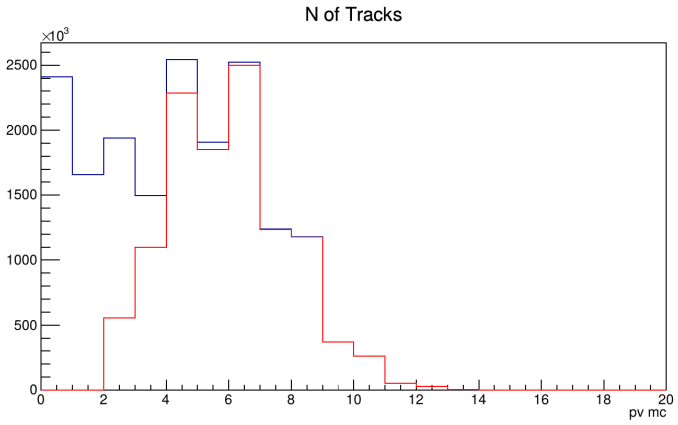
- 4.1.7-dev data for the s**econd stage physics** (**~20M**) will remain
  - 2-nd stage detector set-up, pp 27 GeV
  - the list of good reco files has been prepared by Elena and uploaded to */eos/nica/spd/users/iden/production/spdroot-4.1.7-dev-minbias-27/reco_file_list.txt*
  - *Issuse: FARICH PID needs a fix*
- 4.1.7-dev for the fisrt stage physics (~20M) (PROD2025-002, thx to Artem and Danila!)
  - 10 GeV
  - Detector subsystems: Micromegas, TS, ECal (emulates aluminum plug, but can be used for performance test for the part of installed colorimeter), RS, BBC, ZDC (sketch)
  - Production simu and reco scripts: /cvmfs/spd.jinr.ru/production/MC/minbias-P8-spdroot417-dev.10GeV.V02
  - Lists of reco and praram files (thx to Elena): */eos/nica/spd/users/elenazem/productions/spdroot-4.1.7-dev-minbias-10/PROD2025-002_recofiles.txt*, */eos/nica/spd/users/elenazem/productions/spdroot-4.1.7-dev-minbias-10/PROD2025-002_paramfiles.txt*
  - *Issue: wrong beam pipe material for the first phase*
- Ongoing work on the Singularity image and SpdRoot code to generate data for the first stage using FTF to start pp production at √s = 5 GeV an dd production
- Communicate your requests!

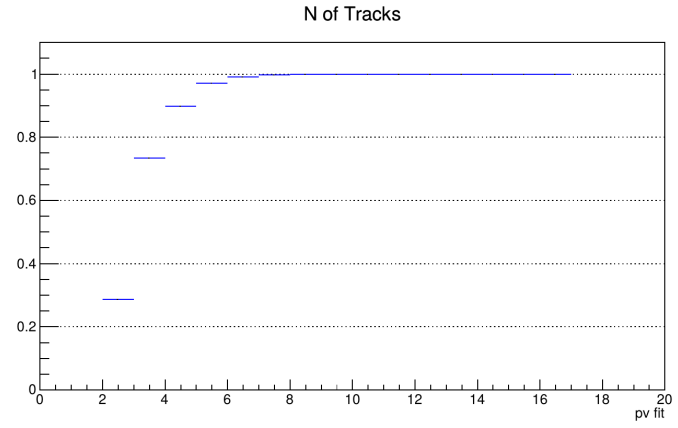
1-st stage sample quality check

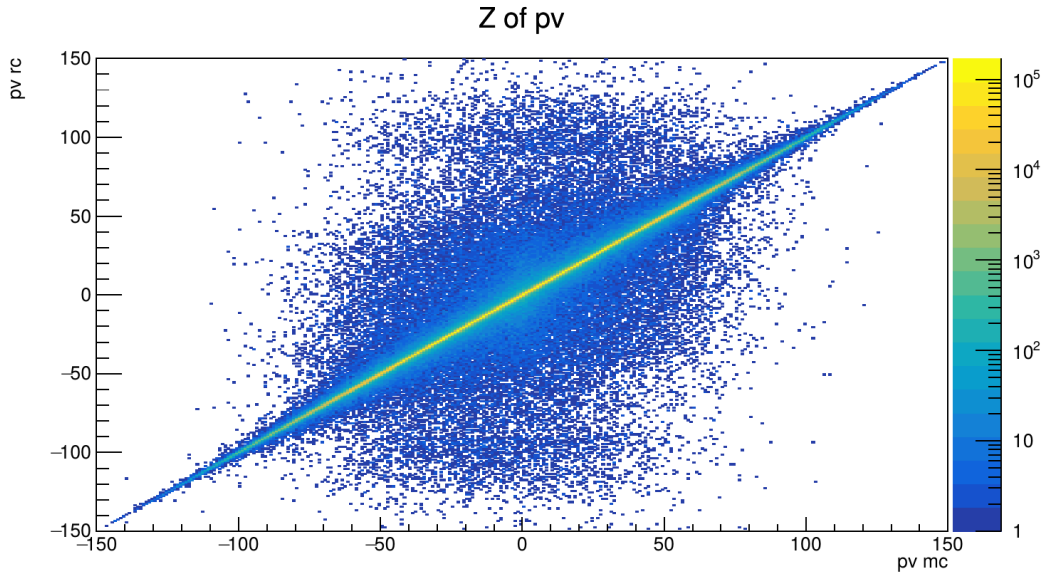
- Elena has conducted a quality check for the pre-production sample of 5M events. For details see her talk the 1-st Stage Group Meeting (https://indico.jinr.ru/event/5277/contributions/30632/attachments/21862/38540/quality_check_zemlyanichkina.pdf)
- Generally, sample can be used for the physics analysis:

- 5 000 000 events available at JINR (more data come soon)
- Fit of PV works good with 5 and more outgoing tracks
- Fit of primary tracks gives correct results if MCT hit exists

1-st stage sample quality check: primary vertex

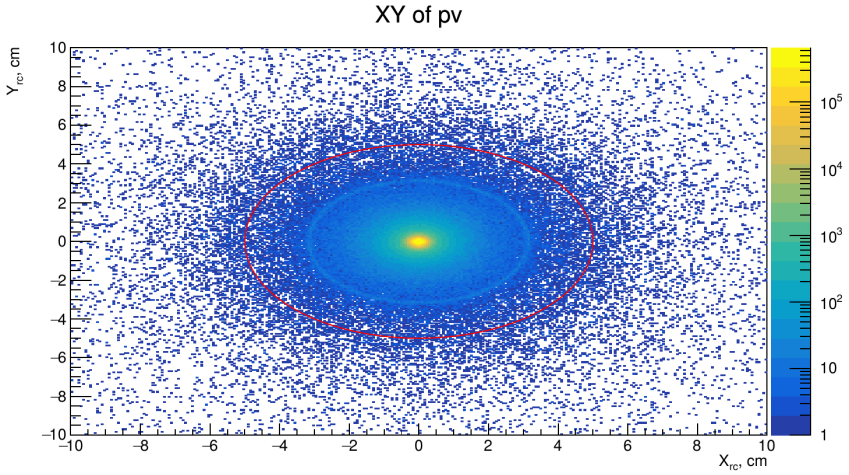


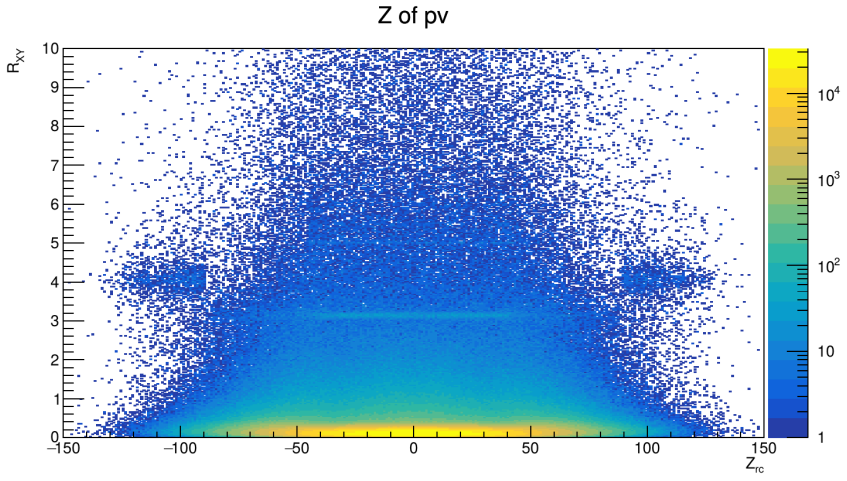


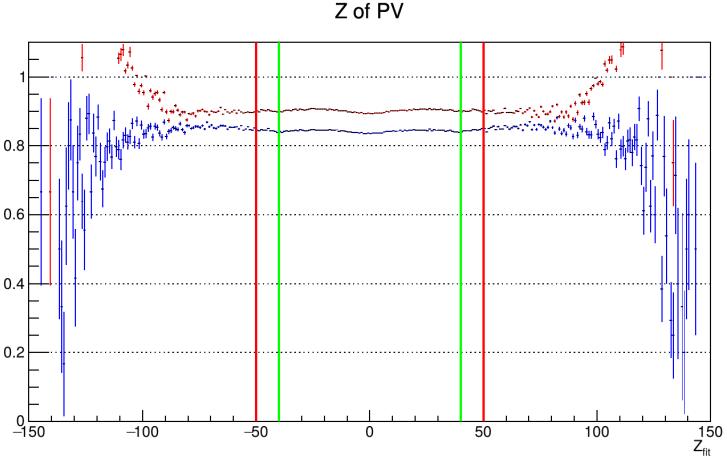


Figures prepared by Elena

1-st stage sample quality check: primary vertex



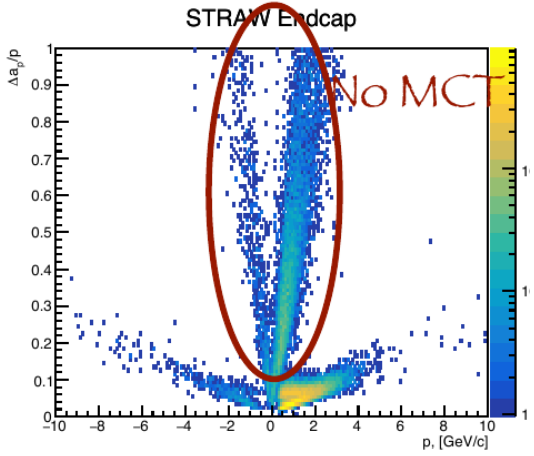


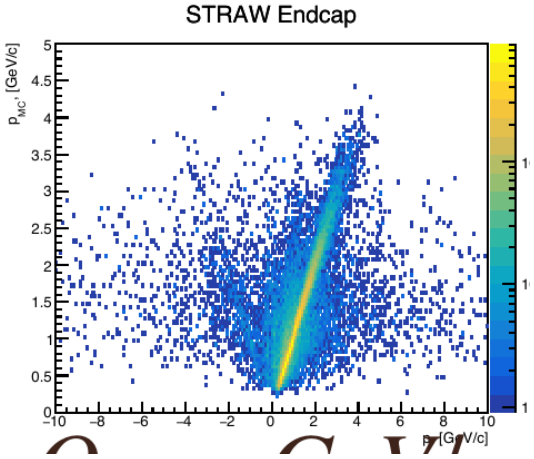


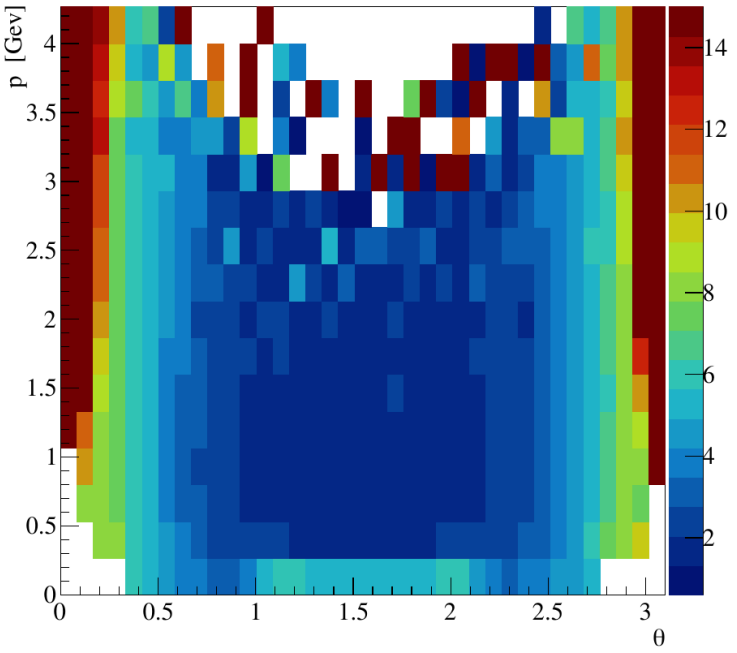
- Figures prepared by Elena
- Left bottom figure: reco_vtx/true_vtx, fit_vtx/true_vtx
- Sometimes interaction of particles with the beam pipe is reconstructed as PV
- Use cuts r of PV
- We should allow multiple primary vertices in reconstruction

1-st stage sample quality check: primary vertex

- See Elena's talk for more details
- To have a meaningful resolution for endcp tracks it is crucial to require a MCT hit







Track fit precision as a function of θ Vs. p

Thank you!