

New spdroot is released

- Version 4.1.0
- Compatible with FairRoot 18.2.0 (use the same installation guide as of 4.0.0, run on SL6/Ubuntu-18.04/Centos7 etc)
- Capable to compile against FairRoot 18.4.2 (= Ubuntu 20.04)
- New event structure (particle-track-vertex)
- Physics examples
- Cleanup of obsolete code, geometry options etc.
- ECAL reconstruction

Migration to FairRoot 18.4.2

- spdroot is ready to migrate to FairRoot 18.4.2 + FairSoft nov20
 - preferred OS: Centos07 (+devtoolset-7), Ubuntu 20.04
 - no support of SL6 anymore
- available for testing in the *development* branch (tag 4.1.0-FR18.4.2)
- Precompiled versions:
 - **FairSoft nov20**

/cvmfs/nica.jinr.ru/spd/centos7/fairsoft/nov20

/cvmfs/nica.jinr.ru/spd/ubuntu/fairsoft/nov20

- **FairRoot v18.4.2**

/cvmfs/nica.jinr.ru/spd/centos7/fairroot/v18.4.2

/cvmfs/nica.jinr.ru/spd/ubuntu/fairroot/v18.4.2

New event structure

- Simulation produces **MC points** in all subdetectors (except TOF, ZDC, BBC)
- MC truth information is organized and stored in **MCEvents**, **MCVertices** and **MCParticles**
- MC points are converted to **MC hits** by tasks - hit producers.
- Reconstructed objects **MCTracks**, **RCVertices**, **RCEcalClusters** and **RCEcalParticles** are produced from MC hits and stored for analysis
- Navigation between objects is possible

Simulated data

TREE NAME: "spdsim".

	DATA BRANCH NAME:	BRANCH OBJECT TYPE:
- simu-event header	"MCEventHeader."	SpdMCEventHeader
- simu-event mctracks	"SpdMCTrack"	TClonesArray[SpdMCTrack]
- its-points	"SpdItsPoint"	TClonesArray[SpdItsPoint]
- ts-barrel-points	"SpdTSTB2Point"	TClonesArray[SpdTSTB2Point]
- ts-endcaps-points	"SpdTSTEC2Point"	TClonesArray[SpdTSTEC2Point]
- ecal-barrel-points	"SpdEcalTB2Point"	TClonesArray[SpdEcalTB2Point]
- ecal-endcaps-points	"SpdEcalTEC2Point"	TClonesArray[SpdEcalTEC2Point]
- rs-barrel-points	"SpdRSTB2Point"	TClonesArray[SpdRSTB2Point]
- rs-endcaps-points	"SpdRSTEC2Point"	TClonesArray[SpdRSTEC2Point]

Tasks

- mc-event	SpdMCEventMaker
- mc-particles	SpdMCEventMaker
- mc-vertices	SpdMCEventMaker
- mc-its-hits	SpdItsMCHitProducer
- mc-ts-hits	SpdTsmCHitProducer
- mc-ecal-hits	SpdEcalMCHitProducer
- mc-rs-hits	SpdRsmCHitProducer
- mc-tracks	SpdMCTracksFinder (+ fit pars., optionally)
- vertices-fit-pars.(mc)	SpdMCVerticesFitter (mc-vertices update)
- rc-vertices	SpdRCVerticesFinder (+ fit pars.)
- rc-ecal-clusters	SpdEcalRCMaker
- rc-ecal-particles	SpdEcalRCMaker

Reconstructed data

TREE NAME: "spdsim"

	DATA BRANCH NAME	BRANCH OBJECT TYPE
- simu-event-header	"MCEventHeader."	FairMCEventHeader
- mc-event	"MCEvent."	SpdMCEvent
- mc-particles	"MCParticles"	TClonesArray[SpdMCParticle]
- mc-vertices	"MCVertices"	TClonesArray[SpdVertexMC(+SpdVertexFitPar)]
- mc-its-hits	"ItsMCHits"	TClonesArray[SpdMCSiliconHit]
- mc-ts-hits	"TsMCHits"	TClonesArray[SpdMCStrawHit(1D/2D)]
- mc-ecal-hits	"EcalMCHits"	TClonesArray[SpdEcalMCHit]
- mc-rs-hits	"RsMCHits"	TClonesArray[SpdRsMCHit]
- mc-tracks	"MCTracks"	TClonesArray[SpdTrackMC(+SpdTrackFitPar)]
- rc-vertices	"RCVertices"	TClonesArray[SpdVertexRC(+SpdVertexFitPar)]
- rc-ecal-clusters	"RCEcalClusters"	TClonesArray[SpdEcalRCCluster]
- rc-ecal-particles	"RCEcalParticles"	TClonesArray[SpdEcalRCParticle]

Physics examples

- *share/examples/SimuQs/Py6.C* - simulation with Pythia6
- *share/examples/SimuQs/Py8.C* - simulation with Pythia8
- *share/examples/jpsi-ee* - simu and reco $J/\Psi \rightarrow ee$
- *share/examples/jpsi-mumu* - simu and reco $J/\Psi \rightarrow \mu\mu$
- *share/examples/chic* - simu and reco $\chi_c \rightarrow J/\Psi$
- *share/examples/ecal* - reconstruction of $\eta \rightarrow \pi^+\pi^-\pi^0$
- *share/analysis/RecoEventFull.C* - reconstruction and event printout

Next steps

- During this week or so
 - major update of the documentation wiki
 - spdroot-4.1.0 in a docker container
 - precompiled version of spdroot-4.1.0 at JINR clusters
 - e-mail to SPD_MC@maillist as soon as it is ready
 - Recover CI/CD

Future plans

- Next major release around June 2021
 - geometry update, RS reco, tracking update, TOF, multithreading, ...
- Several minor releases are planned in between

Many thanks to Artur, Igor, Andrey, Vladimir, Georgy, Sasha for their efforts!