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EURIZON Task 5.5 Status: the drift chamber

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for

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Subtask 5.5.1 - Mechanical design of the IDEA drift chamber

Boundary conditions of the end-plate model

Pre-stressing of stays to compensate DC wires tension

Stays and spoke deformation (to be fully optimized)



- Conceptual design of the IDEA drift chamber completed.
- Preliminary FEA with homogeneous materials in conclusive phases.
- Transition to composite materials undergoing.
- Goal is to complete the full design by fall 2023 and to start construction of a full-length, 1/12 wedge, prototype before the end of 2023.





Subtask 5.5.2 - FPGA-based fast digitizer for the cluster counting regime





approach #3: NALU Scientific ASoCv3



real signals read out with the AsoC chip, (used AWG with low performance: not all peaks detected)



Subtask 5.5.3 - Analysis of beam tests data for cluster counting

Beam test setup at CERN-H8





Waveform signal Ch4 - Event 10 - Sense Wire Diameter 10 um - Cell Size 1.0 cm - Track Angle 45.0 - run_94 - 1.2 GSa/s - Gas Mixture 80/20 0 - 90/10 1 - 85/15 0



Waveform signal Ch12 - Event 37 - Sense Wire Diameter 40 um - Cell Size 2.0 cm - Track Angle 45.0 - run .94 - 1.2 GSa/s - Gas Mixture 80/20 0 - 90/10 1 - 85/15 0

Neural Network



Poisson distributions!



Clusters Finding Efficiency 1 cm cell size Drift Tubes

20

30

40

50

60

Track Angle (deg)

10

ō

1.2

0.8

0.6

0.4

0

Epc 1 cm cell size Drift Tubes







Deliverables and milestones

D5.3	Status report on R&D work on central tracker for the SCT detector	29 - INFN	Report	Public	24
D5.7	Final report on R&D work on (low mass, modular) inner tracker for a detector at future lepton colliders	29 - INFN	Report	Public	44
D5.8	Final report on R&D work on central tracker for a detector at future lepton colliders	29 - INFN	Report	Public	44