

TF3 Symposium Q&A

We kindly request that you write your questions here, and please include your name. If your questions are addressed to a particular speaker please indicate it with @speaker_name. We will be monitoring the page during the day (and after) to reply to questions and include your input.

Input to the task force can also be put into the section at the bottom of this document, or sent to the task force at

ECFA-DetectorRDRoadmap-TF3SolidStateDetectors-Input at cern.ch

Symposium link: <https://indico.cern.ch/event/999816/>

Questions:

Talk 1: Vision on electronics for future trackers in 20 years, 3D integration (FinFET) Speaker: Valerio Re

Speaker's Questions for Discussion:

Questions to the speaker:

Cost of production. Always go to more advanced processes? Scaling limits overcome by 3D integration

Radiation hardness, 300 MGy. Only our community is interested? Show stopper? 100 times more TID.

How can we pay? Funding? The scale has to change

How other, non-semiconductive material, maybe be an alternative ?

Distributed network of designers? Beyond RD53?

Questions not asked:

Does industry have power/cooling constraints similar to ours?

From EHeijne to Everyone: 10:00 AM

Hi, the first necessity is to make sure that the Europractice organization remains. The EU is regularly trying to stop this, which would be catastrophic for access to the main CMOS foundries. Please help pushing EU to keep supporting this access facility. Erik Heijne

Talk 2: Summary of accelerator input section, day 1. Speaker: Didier Claude Contardo

Speaker's Questions for Discussion:

Questions to the speaker:

Evolving CMOS sensors with smaller feature size, you end up with very small pixels.
In stacking them you end up with a more rad-hard system than the rad-hardness of a single layer.

Talk 3: Timing 4D without gain - 3D and more , intrinsic limitation Speaker: Gregor Kramberger

Speaker's Questions for Discussion:

"10 ps Not completely impossible" very reasonable statement

Questions to the speaker:

Need to have very performing electronics
Titling of tracks in simulation

Talk 4: 4D tracking - sensors with internal gain, Speaker: Nicolo Cartiglia

Speaker's Questions for Discussion:

Questions to the speaker:

Talk 5: Silicon at extreme fluences, Speaker: Prof. Marko Mikuz

Speaker's Questions for Discussion:

Questions to the speaker:

Difference between high and low fluxes
1E14 in 2 weeks or in 1 mS: no difference
1E17: acceptor introduction, current increase, trapping: need to measure them, do not extrapolate!

Talk 6: Passive CMOS in twenty years, Speaker: David-Leon Pohl

Speaker's Questions for Discussion:

Questions to the speaker:

Talk 7: Future CMOS technologies for charge particles tracking and high time resolution in CMOS , beyond 65 nm, Speaker: Walter Snoeys

Speaker's Questions for Discussion:

Questions to the speaker:

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Where do you put the TDC in this design? Periphery? Hybrid?

Talk 8: Evolution of the CMOS technology for monolithic detectors, 3D - modules, 20 years visionary talk from a physicist point of view. Speaker: Petra Riedler

Speaker's Questions for Discussion:

Questions to the speaker:

Talk 9: Future Requirements on Interconnection Technologies for Hybrid Detector Modules. Speaker: Thomas Fritzsche

Speaker's Questions for Discussion:

Questions to the speaker:

Chip to wafer is cheaper, it would be a good choice to save money

ROC and sensor layout has to allow C2W assembly because dicing have to be done after assembly; usually the sensor dicing line is blocked by the overhanging end of column logic of the ROC

Talk 10: Use of diamond detectors in 20 years: what R&D needs to be done to use it in the first layer of FCC?, Speaker: Alexander Oh

Speaker's Questions for Discussion:

Questions to the speaker:

Talk 11: Simulation tools for radiation detectors before and after irradiation. Speaker: Dr Joern Schwandt

Speaker's Questions for Discussion:

Questions to the speaker:

Panel 1: Beam test/irradiation/femto laser: key facilities needed to pursue the R&D phase (EU project, funding tools), Speakers: Dr Ivan Vila Alvarez (Instituto de Física de Cantabria (CSIC-UC)) . Marcel Stanitzki (Deutsches Elektronen-Synchrotron (DE)) . Marko Mikuz (Jozef Stefan Institute (SI))

From Christian Ohm to Everyone: 06:07 PM

Looks like 2 GeV at ESS:

<https://europeanspallationsource.se/accelerator/linac#high-energy-beam-transport>

"When entering the HEBT the proton beam will have a diameter of about 2 mm and an average beam power of 5 MW."

From Philip Allport to Everyone: 06:08 PM

<https://link.springer.com/article/10.1134%2FS1027451020070137>

From Marko Mikuž to Everyone: 06:10 PM

62.5 mA

4% still yields 2.5

From Philip Allport to Everyone: 06:11 PM

indeed. There are also older spallation sources which may be becoming more available as ESS turns on eg ISIS at RAL.....

From Marko Mikuž to Everyone: 06:12 PM

I have a contact there, can inquire

From Philip Allport to Everyone: 06:13 PM

So do I. We should maybe liaise on this.

Questions:

Panel 2:Industrialization/supply chain for small - medium - large project (EU project, funding tools) Round table Speakers: Iain Sedgwick (STFC) , Jerome Baudot (IPHC - Strasbourg) , Michael Campbell (CERN)

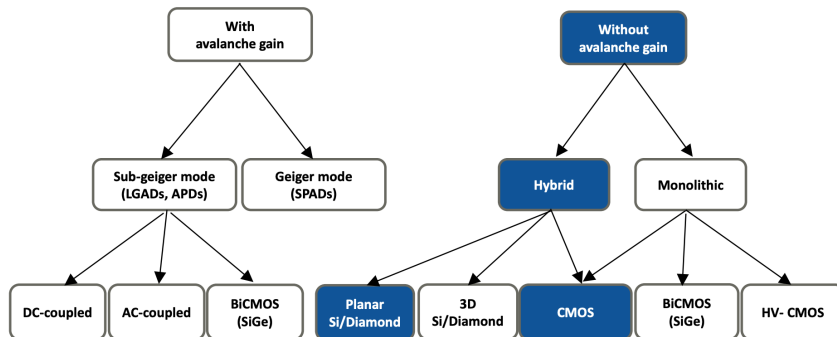
Questions:

General question:

this scheme:

SOLID STATE DETECTORS FOR FUTURE (4D) TRACKERS

This talk



Is in several talks. Is it in one of the roadmap documents?

⇒ Not yet, we used it to provide uniformity among talks.

I put in in the document of the symposium, TF3_Schematics.ppt, the updated version