Introduction to
'DRDT 7.6' : Monolithic Sensor ASICs

Implementing DRD7 : R&D Collaboration on Electronics and On-detector Processing

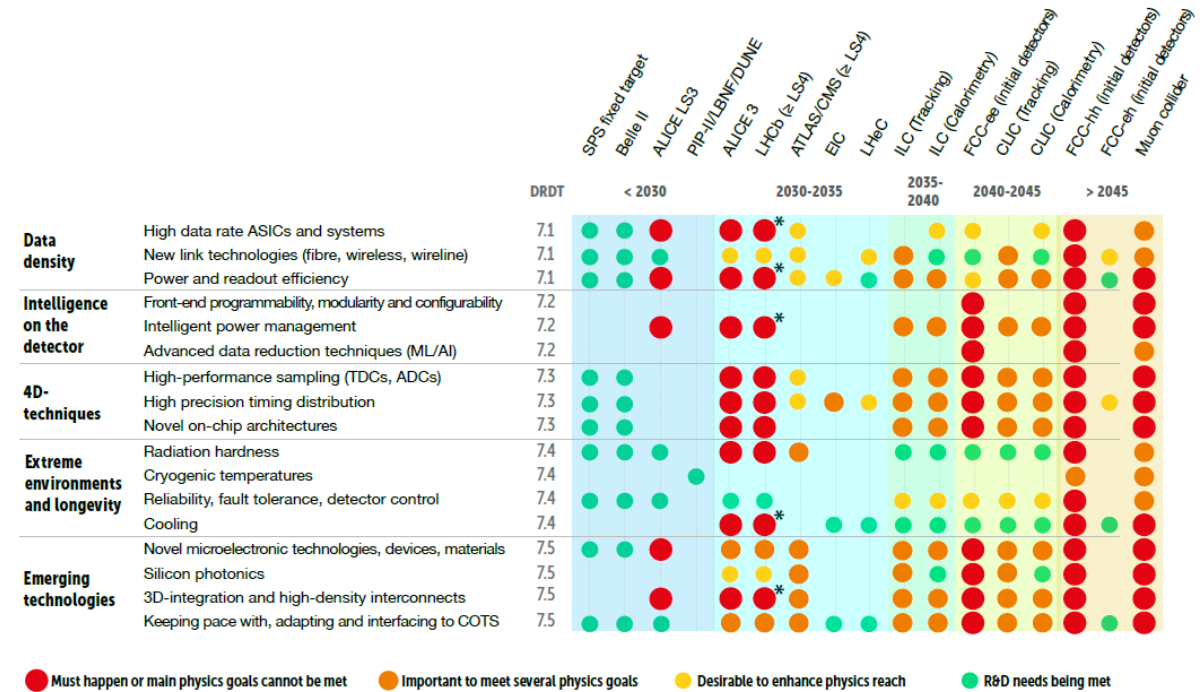CERN – Wednesday March 15th , 2023

Marlon Barbero / Iain Sedgwick / Walter Snoeys

'DRDT 7.6' introduction

- DRD7 in original ECFA document: 5 tasks.

- 2 additional areas proposed:

to address challenges of ASIC developments

- 7.6: Common R&D issues related to monolithic sensors
- 7.7: Access to new technologies and tools for ASIC design

- Coordination 7.6: Marlon Barbero (CPPM), Iain Sedgwick (STFC), Walter Snoeys (CERN)

Goals of 'DRDT 7.6'

- Build on expertise available in the community

- Strong relations with DRDT 3.1 to facilitate and coordinate exploration of new technologies (lowering costs and risks to DRDT 3.1 R&D when transitioning to larger scale developments or advanced technologies)

- Develop common standards, methodologies, identify resources to address large and complex monolithic ASIC design

- Ease relations to facilities and tools for R&D

- Potentially act as reviewing and coordination body

Goals of this 1st kickoff session today

- Start to draw how our organization should function !

- Schematically:
    - 1st area: Smaller-scale prototyping, exploring novel concepts, delivering proof-of-principle demonstrators … these activities do not necessarily lead to large scale production, can be exploratory (→ not in 'DRDT 7.6').
    - 2nd area: Common generic developments, complex design flow, negotiated access to technologies with industrials, … common community effort, not exploratory (→ in 'DRDT 7.6').
    - Joint body to avoid parallel or conflicting proposals, to enhance readability of our work (no overlap, no duplication of efforts …)? Yet efficiently organize work in our community.

- In today's meeting, discuss topics related to 'DRDT 7.6' "added-value":

    - How to choose technological focus?
    - How to avoid single techno. source for "larger" projects?
    - Should we go to deeper sub-micron than current?
    - What model to manage relations to foundries?

    - How to access sensitive foundry information (NDAs, profiles for TCAD etc..)?
    - Management of support?
    - Design methodology? Digital tools and verification?

'DRDT 7.6' agenda today

- 4 short 10-minute talks oriented to specific relatively advanced developments as examples of questions, issues encountered in such developments, methodologies developed.

- 5 minutes for discussion at end of each talk

- Leading to a 20-25 minutes general discussion on 'DRDT 7.6' organization and model for collaboration:

Introduction		*Marlon B. Barbero*
40/S2-C01 - Salle Curie, CERN		*13:30 - 13:40*
Monolithic Sensors in ALICE		*Magnus Mager*
40/S2-C01 - Salle Curie, CERN		*13:40 - 13:55*
ALICE ITS3 - The unfashionable but important bits		*Frederic Morel*
40/S2-C01 - Salle Curie, CERN		*13:55 - 14:10*
Belle II VXD Upgrade		*Jerome Baudot*
40/S2-C01 - Salle Curie, CERN		*14:10 - 14:25*
MightyPix		*Ivan Peric*
40/S2-C01 - Salle Curie, CERN		*14:25 - 14:40*
Longer Term R&D and Discussion		*Walter Snoeys*
40/S2-C01 - Salle Curie, CERN		*14:40 - 15:00*

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Speakers, please respect the time allowed