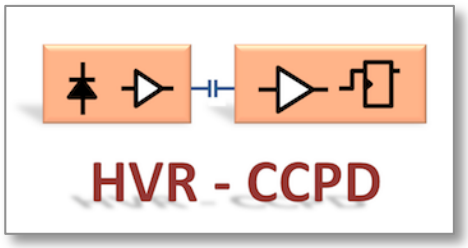
Introduction & New

HV/HR-CMOS at Genova

Genova L204 & Vidyo

6 October 2014

G. Darbo – INFN / Genova



Indico agenda:

https://agenda.infn.it/conferenceDisplay.py?confId=8662

Activities and INFN Support

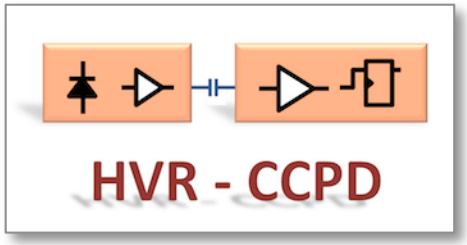
- *HV-CMOS Hybridization has been supported by CSN1 with funds in 2014*
  - some summary reported to the last week CSN1: https://agenda.infn.it/conferenceDisplay.py?confId=8515

- *HV/HR-CMOS Project presented to CSN5 for the 3 year period (2015-17)*
  - Develop chip (STMicroelectronics) and hybridization
  - **Project approved** last week with some fund reduction and some sj on chip submission
  - Project Proposal (on SharePoint): https://espace.cern.ch/project-INFN-HVR-CCPD/SitePages/Home.aspx
  - Presentation in CSN5 (Valentino Liberali): https://agenda.infn.it/getFile.py/access?contribId=18&sessionId=1&resId=0&materialId=slides&confId=8452

HVR_CCPD – Cost & Organization

3 year project submitted to CSN5: ***HVR_CCPD***

- Develop HV/HR-CMOS chip (HVR)
- Study Capacitively Coupled Pixel Detector (CCPD)
- ~300 k€ project cost



National Coordinator:

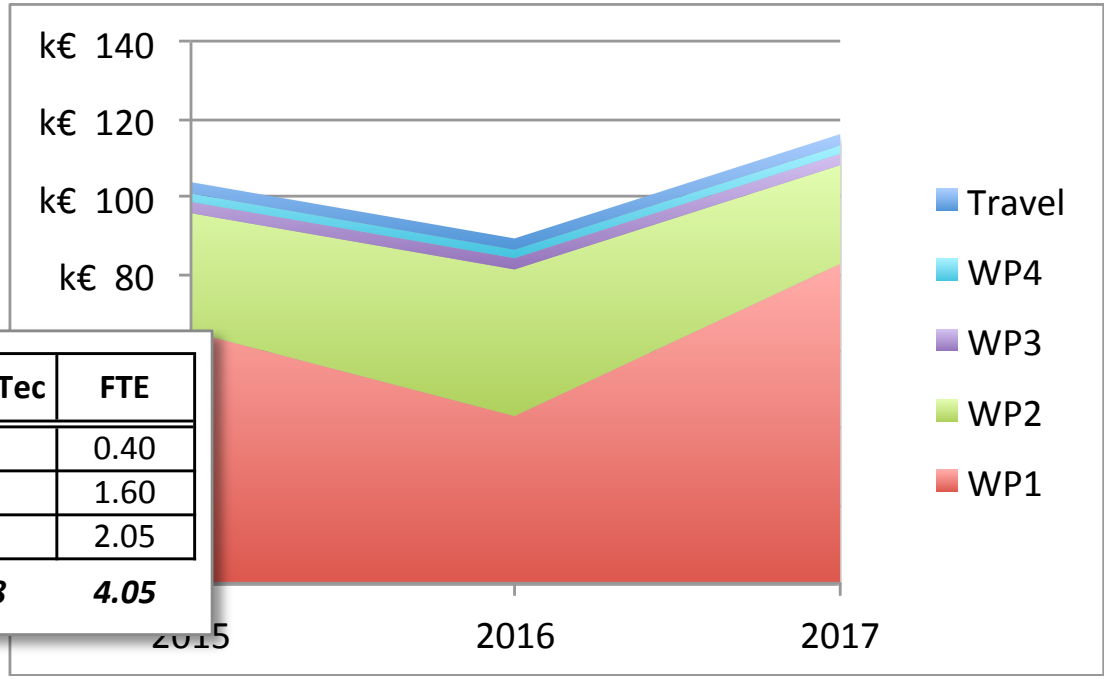
- Attilio Andreazza (MI)

Collaborative tools:

- *SharePoint: cern.ch/HVR_CCPD*
- *Proposal on SharePoint*

WORKPACKAGES/COORDINATORS/INSTITUTES

	Name	Sezioni Sez. Coord.
WP1	HV/HR-CMOS Chip Design & Test	MI
WP2	CCPD hybridization	GE
WP3	Module assembly & Test	GE
WP4	Irradiation & Test beam	MI



INFN Group	Sez.	Coordinator	Res/Tec	FTE
Bologna	BO	Carla Sbarra	3	0.40
Genova	GE	Giovanni Darbo	8	1.60
Milano	MI	Attilio Andreazza	7	2.05
Total	***3***		***18***	***4.05***

HV/HR-CMOS Project in ATLAS

- *Weekly meeting each Monday at 17:00*
  - Main discussion items (until now) testing and chip design

- *After summer created a task force to define a chip "demonstrator" to connect to the FE-I4*
  - Task force to define a demonstrator chip to implement in a few technologies – recommend technologies to use.
  - Membership: Maurice GS (Chair), Ivan Peric (D), Patrick Pangaud (F), Hans Krüger (D), Tomasz Hemperek (D), **Valentino Liberali** (I), Renato Turchetta (UK) + observers.
  - Initial proposal: the total demonstrator area should be ~1 cm^2 with:
    - 50% of the active area for coupling to FE-I4 (CCPD)
    - min. 30% for standalone readout (monolithic)
    - max. 20% for test structures – ex. Pixel directly connected to probe pads
  - Aim is to arrive to a **demonstrator chip**, **irradiated** to $1x10^{15}$ n_{eq}/cm^2 and measured at **test beam** by fall 2015

CPIX2014 – Bonn Sept.2014

http://CPIX14.org

3 day workshop on CCPD and MAPS

- Applications: HEP, X-ray, Electron Microscopy,…
- Industrial technology: ESPROS, Lfoundry, TowerJazz, GlobalFoundries, AMS
- Design and test
- Hybridization (very little): see R.Yarema talk: Advances in Bonding technologies (chip to wafer and wafer to wafer)
  http://indico.cern.ch/event/309449/session/25/contribution/27/material/slides/0.pdf

CPIX14

Workshop on

CMOS Active Pixel Sensors

for Particle Tracking

15th - 17th September 2014
BONN (Germany)

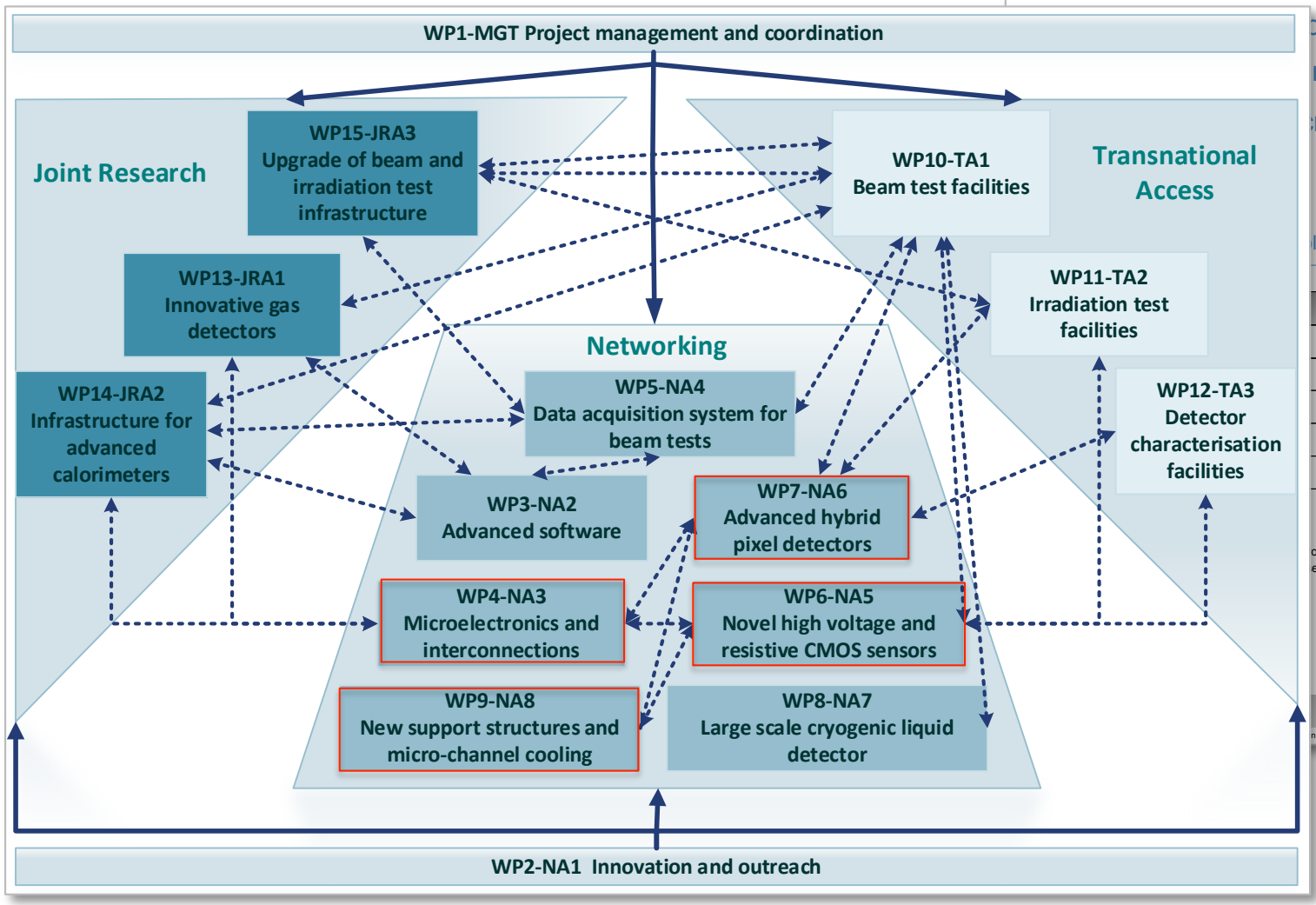
CPIX14 focuses on technology and design of CMOS Pixel Sensors for particle detection.

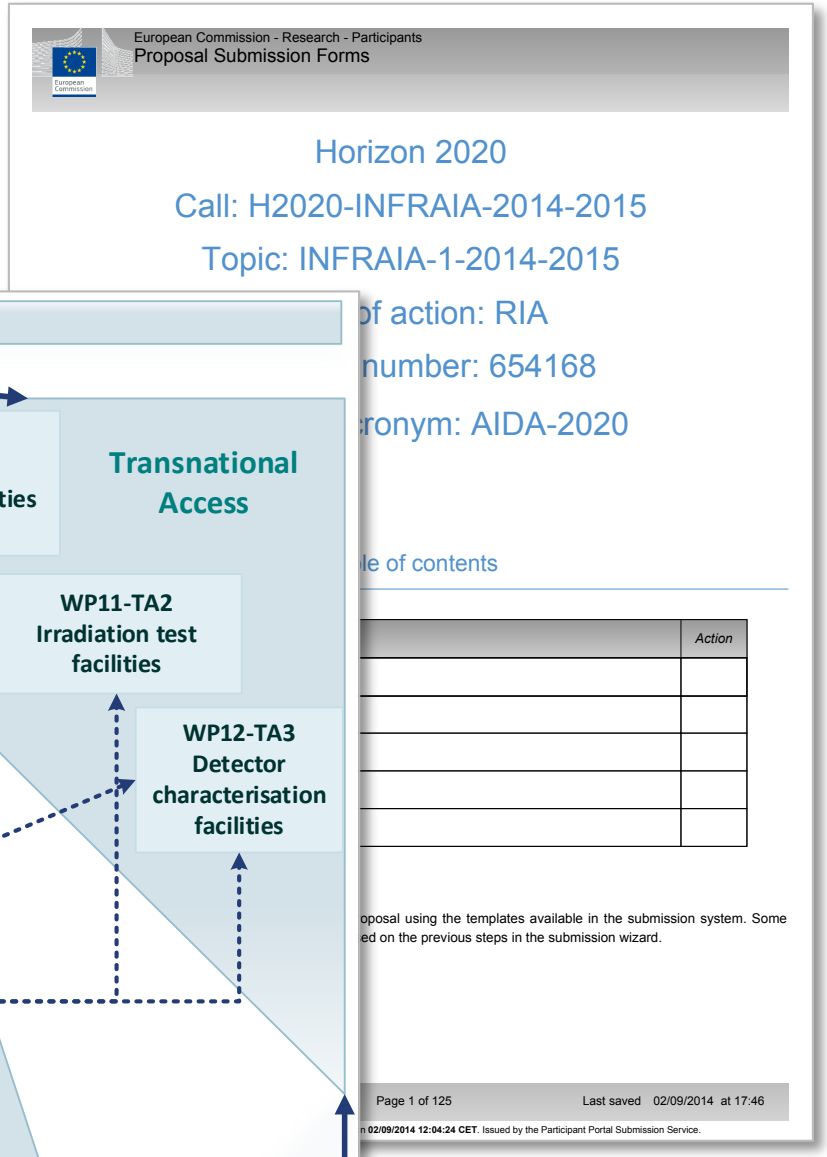
Topical interest:
- Design aspects
- CMOS technologies
- Signal collection
- Radiation hardness
- Simulations
- Lessons learned

81 Participants

AIDA-2020

- *AIDA-2020 proposal*
  - Submitted on 2 Sept. 2014
  - Approval status before end of the year





Silicon in AIDA-2020: Beneficiaries

WP4:

Electronics & Interconnections

AIDA 2 - WP Name - Task 3.2: 65 nm chips

Beneficiary short name*	Institute
CERN	CERN
INFN	PAVIA
INFN	TORINO
INFN	MILANO
IN2P3	CPPM
IN2P3	OMEGA/LAL/LPNHE
AGH	AGH-Krakow

AIDA 2 - WP Name - Task 3.3: SiGe chips

Beneficiary short name*	Institute
IN2P3	OMEGA
IN2P3	CPPM
CEA	SACLAY
AGH	AGH-Krakow
UHEIDELBERG	University of Heidelberg

AIDA 2 - WP Name - Task 3.4: Interconnection and TSV

Beneficiary short name*	Institute
INFN	PAVIA
INFN	GENOVA
INFN	PERUGIA
IN2P3	CPPM
IN2P3	LAL
UBONN	University of Bonn
UU	University of Uppsala
UGLAS	University of Glasgow
MPG	MPI Munich

WP6:

Advanced Hybrid Pixel Detectors

AIDA 2 - WP Name - Task 5.2: TCAD SIMULATION

Beneficiary short name*	Institute
INFN	Perugia
INFN	Trento
CERN	LCD

AIDA 2 - WP Name - Task 5.3: Process optimization

Beneficiary short name*	Institute
CSIC	CNM
FBK	

AIDA 2 - WP Name - Task 5.4: Detector validation (3D and planar sensors)

Beneficiary short name*	Institute
CERN	LCD
MPG	MPP
Manchester	
INFN	Milano
INFN	Firenze

WP7:

HV/HR-CMOS

AIDA 2 - HV-CMOS - Task 6.2: Simulation

Beneficiary short name*	Institute
CPPM	Marseille
Bonn	
STFC	RAL

AIDA 2 - HV-CMOS - Task 6.3: Sensor development

Beneficiary short name*	Institute
Bonn	
KIT	Karlsruhe
CEA	Saclay
STFC	RAL
Glasgow	
Liverpool	
CPPM	Marseille

AIDA 2 - HV-CMOS - Task 6.4: Hybridisation

Beneficiary short name*	Institute
IFAE	Barcelona
Liverpool	
INFN	GENOVA

ATLAS – Beneficiary

CMS – Beneficiary

GENOVA