

Very successful workshop past June!

<https://indico.cern.ch/event/1040996/>

RD51 Collaboration Meeting and Topical Workshop on FE electronics for gas detectors

14–18 Jun 2021
remote-only by Zoom
America/Sao_Paulo timezone

Overview

Timetable

Contribution List

My Conference

My Contributions

Registration

Dear Colleagues,

RD51 Collaboration Meeting will take place by Zoom remote connection between **14th and 18th June 2021**.

Topical workshop "**Front End Electronics for Gas Detectors**" will take place **Tue. 15th, Wed. 16th and Thu. 17th, 2pm-6:30pm CEST**.

We are looking forward to seeing you remotely!

“ASIC session” was a bit “crowded”, but it was the way to provide an extensive overview of chips for gas detector.
› 15 ASICs presented.

09:00 → 10:50	Topical Workshop on Front End Electronics for Gas Detectors: Linear Chips	🔗
Conveners: Marco Bregant (Universidade de Sao Paulo (BR)), Sorin Martoiu (Horia Hulubei National Institute of Physics and Nuclear Engine)		
09:00	Intro Speaker: Sorin Martoiu (Horia Hulubei National Institute of Physics and Nuclear Engine) 📎 RD51WS2021_SM...	🕒 30m 🔗
09:30	ROC (OMEGA) Family Speakers: Stephane CALLIER (OMEGA - Ecole Polytechnique - CNRS/IN2P3), Stephane Callier (OMEGA - IN2P3/CNRS) 📎 SC_RD51_OMEGA...	🕒 10m 🔗
09:40	nXYTER Speakers: Krzysztof Kasinski, krzysztof kasinski (AGH) 📎 RD51_XYTER.pdf	🕒 10m 🔗
09:50	GEMROC (AGH) Speaker: Tomasz Andrzej Flutowski (AGH University of Science and Technology (PL)) 📎 rd51_fee_2021_GE-	🕒 10m 🔗
10:00	TIGER Speakers: Manuel Dionisio DA ROCHA ROLO (INFN), Manuel Dionisio Da Rocha Rolo (Universita e INFN Torino (IT)) 📎 20210617_darocha.	🕒 10m 🔗
10:10	New ASIC (INFN TO) Speakers: Manuel Dionisio DA ROCHA ROLO (INFN), Manuel Dionisio Da Rocha Rolo (Universita e INFN Torino (IT)) 📎 20210617_darocha...	🕒 10m 🔗
10:20	VFAT Speaker: Francesco Licciulli (Universita e INFN, Bari (IT)) 📎 VFAT3_New_ASIC...	🕒 10m 🔗
10:30	New ASIC (INFN Ba) Speaker: Francesco Licciulli (Universita e INFN, Bari (IT))	🕒 10m 🔗
10:40	VMM Speaker: George Iakovidis (Brookhaven National Laboratory (US)) 📎 2021_06_17_IakovL...	🕒 10m 🔗
10:50 → 11:10	Coffee Break	🕒 20m
11:10 → 12:10	Topical Workshop on Front End Electronics for Gas Detectors: Linear Chips	🔗
Conveners: Marco Bregant (Universidade de Sao Paulo (BR)), Sorin Martoiu (Horia Hulubei National Institute of Physics and Nuclear Engine)		
11:10	AFTER/AGET Speaker: Pascal Baron (Universit Paris-Saclay (FR)) 📎 AFTER_RD51.pdf	🕒 10m 🔗
11:20	SAMPA Speaker: Marco Bregant (Universidade de Sao Paulo (BR)) 📎 2106_RD51_Topical...	🕒 10m 🔗
11:30	New ASIC (TPC) Speakers: Damien Neyret (Universit Paris-Saclay (FR)), Damien Neyret (CEA/IRFU,Centre d'etude de Saclay Gif-sur-Yvette (FR)) 📎 NewChip_RD51wor...	🕒 10m 🔗
11:40	WASA Speakers: Zhi Deng (Tsinghua University), Zhi Deng (Tsinghua University (CN)) 📎 WASA_a_Low_Pow...	🕒 10m 🔗
11:50	PADI Speaker: Mircea Iuliu Ciobanu (Institute of Atomic Physics) 📎 PADI-2.pdf 📎 PADI-new-models-2...	🕒 10m 🔗
12:00	GEMINI Speaker: Andrea Abba 📎 GEM DAQ-2021.pdf	🕒 10m 🔗
12:10 → 12:40	Topical Workshop on Front End Electronics for Gas Detectors: TDC	🔗
12:10	PicoTDC Speaker: Jorgen Christiansen (CERN) 📎 PicoTDC_RD51.pdf 📎 PicoTDC_RD51.pptx	🕒 30m 🔗
12:40 → 13:30	Topical Workshop on Front End Electronics for Gas Detectors: Discussion	🔗

ASIC overview

Name	Exp	Detectors	#Ch	Shaping	Noise	Range [ke]	Input signal	Pol.	ADC [#bits]	fs [MHz]	P/ch [mW]	Feature	Technology	Radhard
AFTER	T2K; T2K upgrade	TPC, micromegas end-plate	72	50-1000	(350-1800)e + (22-1.8)e/pF	4 ranges: 750/1500/2250/3800	current	both	external 12-bit ADC	1 to 50 SCA sampling	8	SCA	0.35 μm CMOS	N.D.
AGET	ACTAR, AT-TPC, SPIRIT	MGPD+DSSD	64	25-500	(435-34000)e + (19-7.4)e/pF	4 ranges: 750/1500/6240/62400	current	both	external 12-bit ADC	1 to 100 SCA sampling	10	SCA; Triggerless; selective readout	0.35 μm CMOS	N.D.
DREAM	CLAS12	MGPD	64	25-450	(394-2140)e + (10-0.34)e/pF	4 ranges: 312/624/1248/3744	current	both	external 12-bit ADC	1 to 50 SCA sampling	10	SCA; Trigger	0.35 μm CMOS	N.D.
GEMROC	(Client under NDA)	GEMs	64	30-200	N.D.	1fC -> 500fC	charge	negative	N.D.	40MHz	1mW	//	0.35 SiGe	N.D.
HARDROC3	ILC CALICE sDHCAL	RPC	64	50-150 (Q) 20 (T)	N.D.	10fC -> 50pC	current	negative	N.D.	50MHz	1mW	Zero Suppression	0.35 SiGe	N.D.
PADI-X	CBM	RPC, Diamond, Straw Tubes, Silicon, Micro-Channel Plates, Channel Electron Multiplier, Scintillation, PMT	8	0	N.D.	1 fC - 2 pC	current	pos/neg	external	//	16.8	Setable Input impedance: 50 - 400 Ω	CMOS UMC-180 nm	2.4
PADI-XI	CBM	//	8	2.5-17	N.D.	1 fC - 2 pC	current	pos/neg	external	//	22	Setable Input impedance: 18 - 250 Ω	CMOS UMC-180 nm	2.4
PADI-XII	for future experiments	//	8 or 4 channels	2.5-17	N.D.	1 fC - 2 pC	current	pos/neg	external	//	24 for LED / 32 for PSA	Setable Input impedance: 18 - 250 Ω	CMOS UMC-180 nm	2.4
PETIROC2	CMS Muon	RPC (was designed for SiPM)	32	25-100 (Q)	N.D.	1mV (~1pe)	voltage	both	10 bits	N.D.	6mW	//	0.35 SiGe	N.D.
SAMPA_v4	ALICE	TPC-GEM / MCH-MWPC	32	160/320	550e+25e/pF	400/600 (@160ns) 3100 (@300ns)	charge	pos/neg	10 bits	10 MHz	20	Z.S. Baseline correction. Huffman.	130 nm	N.D.
SAMPA_v5	sPHENIX	TPC-GEM	32	80/160	550e+25e/pF	400/600	charge	pos/neg	10 bits	10/20 MHz	20	Z.S. Baseline correction. Huffman.	130 nm	N.D.
STAGE	HARPO	MGPD+DSSD	64	25-4000	(435-34000)e + (19-7.4)e/pF	4 ranges: 750/1500/6240/62400	current	both	external 12-bit ADC	1 to 100 SCA sampling	10	SCA; Triggerless; selective readout	0.35 μm CMOS	N.D.
STS/MUCH-XYTER2.2	CBM Experiment at FAIR	Microstrip silicon detectors at Silicon Tracking System, GEM detectors at Muon Chamber	128	90-260	550e+25e/pF	624ke with for GEM, 75ke for Silicon	charge	pos/neg	5	continuous-time	10	BaselineCorrection / PeakFinding	UMC 180 nm CMOS	N.D.
VMM3a	ATLAS	New small wheel, sTGC, Micromegas	64	25-200	depends configuration	2pC at 0.5mV/FC, in linear range	charge		3 ADCs per channel, 10b, 8b, 6b	200ns conv. time	~11mW	data driven, Baseline stabilization, neighbouring logic, fast digitisation, Peak Finding, timing information, and many more	130nm GF	>300kRad
WASA	CEPC	TPC, GEM	16	160	533e +9.1e/pF	748.8	charge	negative	10	100M max.	2.33	direct waveform output	65nm CMOS	N.D.

Future ASICs

Beside existing chips, a few new projects were presented, too

Let me comment the joint effort IRFU - São Paulo for a next generation ASIC devoted to gaseous detector:

- MPGD as main target case
- Move to finer technology (extend availability)
- Preliminary goals:
 - ~64 chs
 - Several ranges (both peaking time and gain)
 - Large input capacitance range
 - 12-bit, >50 MSps ADC
 - High input rate (>25 kHz/ch)
 - Triggered & Continuous readout
 - Etc.

Still in the pre-design phase (specification phase).

Inputs, suggestions, and requests from the detector developers and users, the MPGD community, are welcome!

Please enter in contact with us:

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