

CALIFA DAQ

Readout and Electronics status update

Tobias Jenegger

R³B Week May 2023

Current Status

Filling CEPA

Final Electronics Configuration



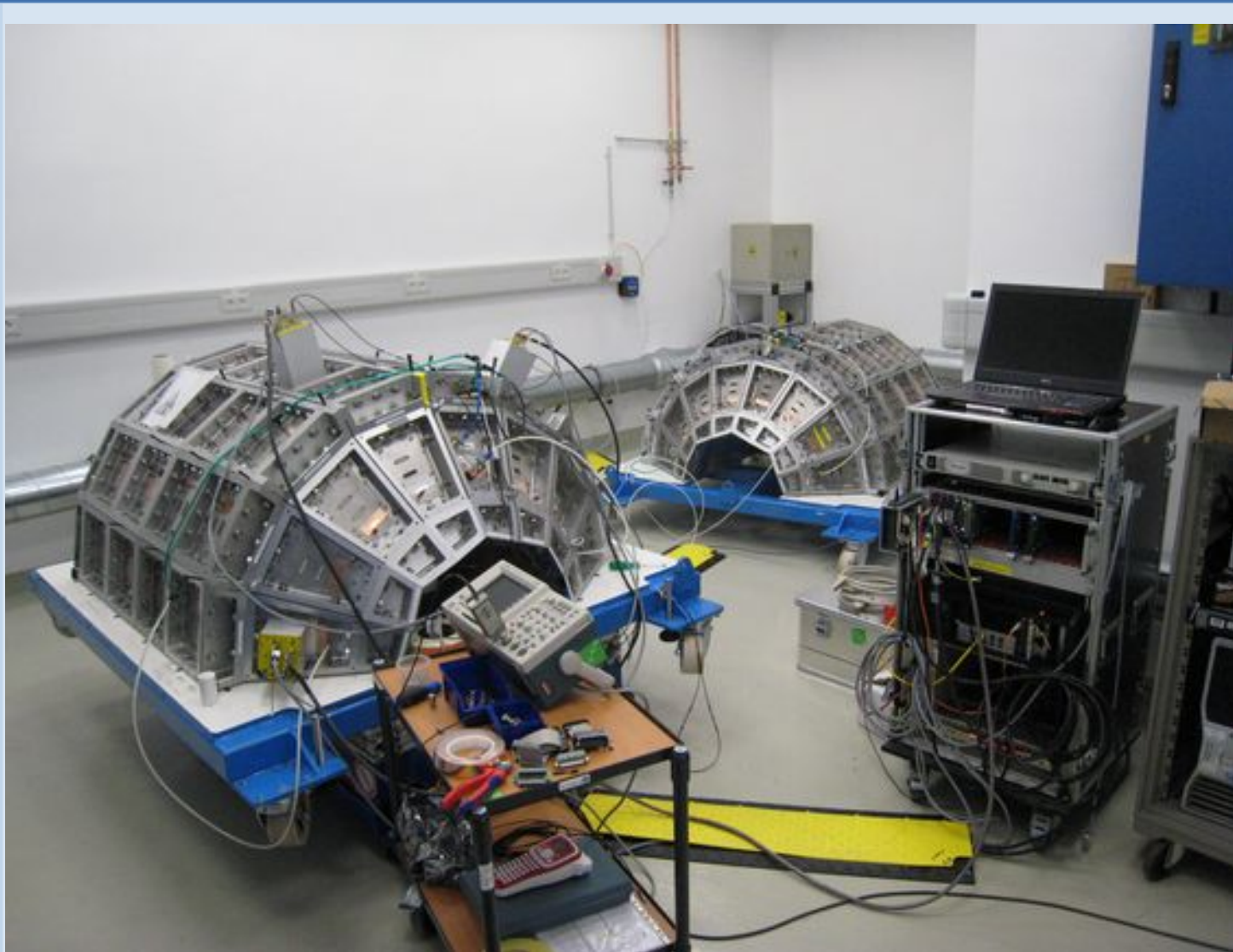
Funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) under Germany's Excellence Strategy – EXC-2094 – 390783311, BMBF 05P19WOFN1, 05P21WOFN1 and the FAIR Phase-0 program



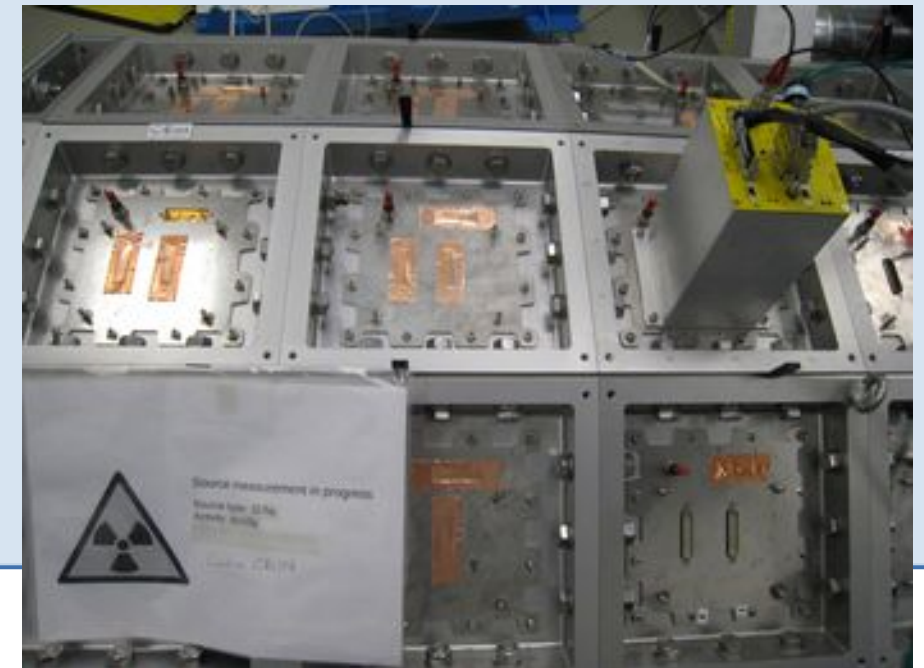
TUM Members:
Roman Gernhäuser, Lukas Ponnath, Philipp Klenze, Tobias Jenegger

Where is CALIFA?





- Noise debugging
- Cable/connectors checking
- Etc.
- More in Stefan Eder's talk

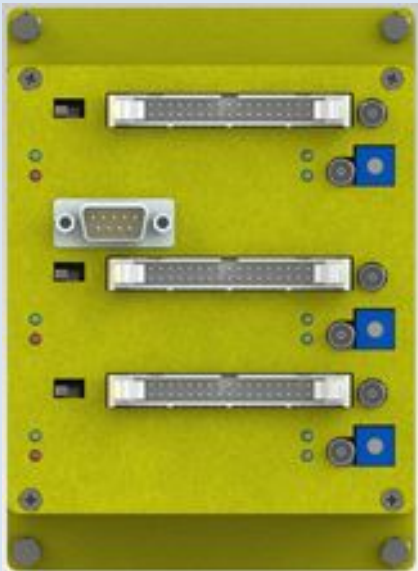


Filling CEPA

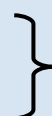
- Most forward section: $7^\circ \leq \theta \leq 19^\circ$
- 96 CsI crystals

Mesytec MPRB-48 Dual Range Preamps

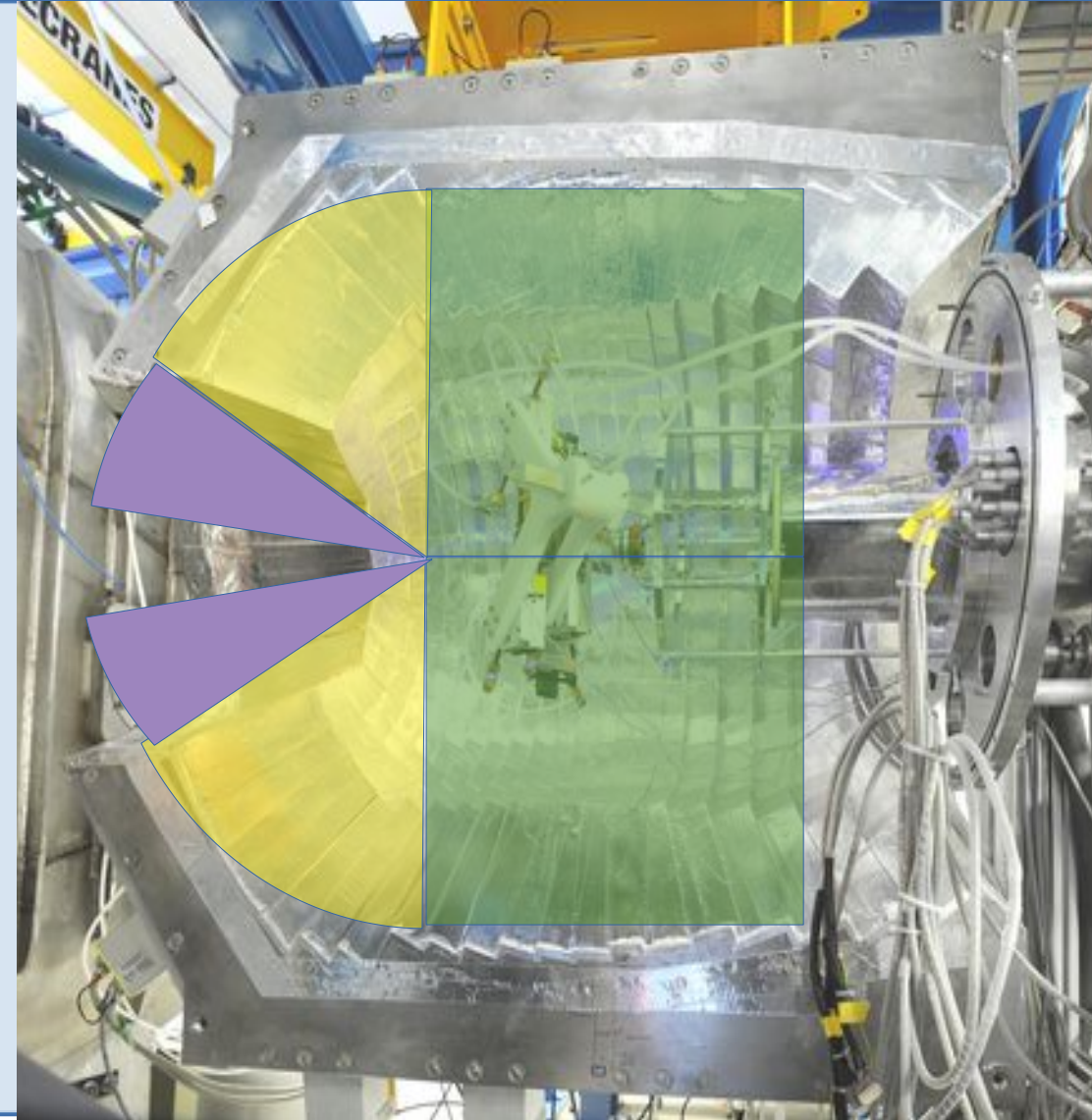
They get mounted on iPhos tiles

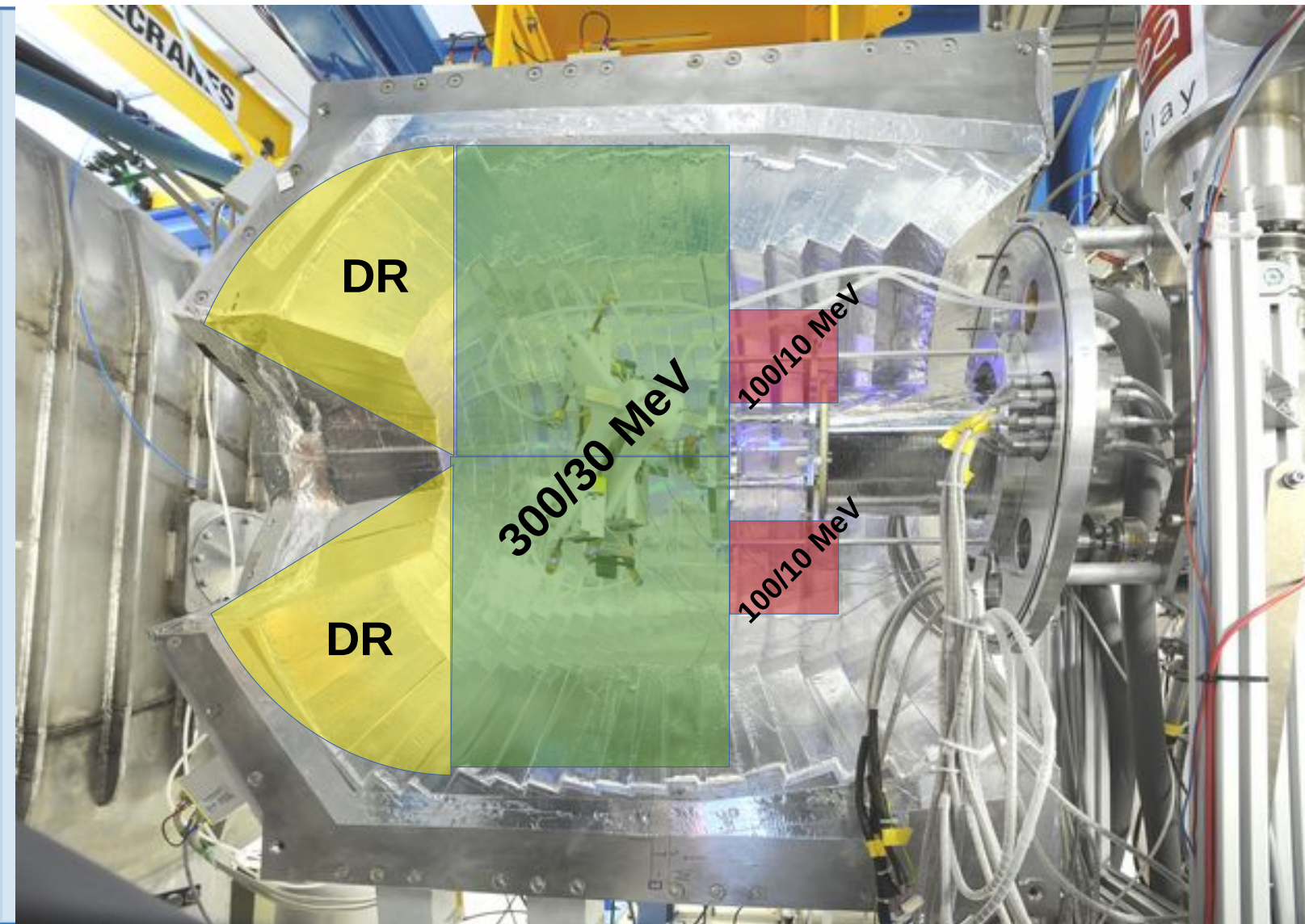


Connected to iPhos APDs
(32 channels)



Connected to CEPA APDs
(16 channels)





iPhos:

- completely filled
- readout with Dual Range Preamps

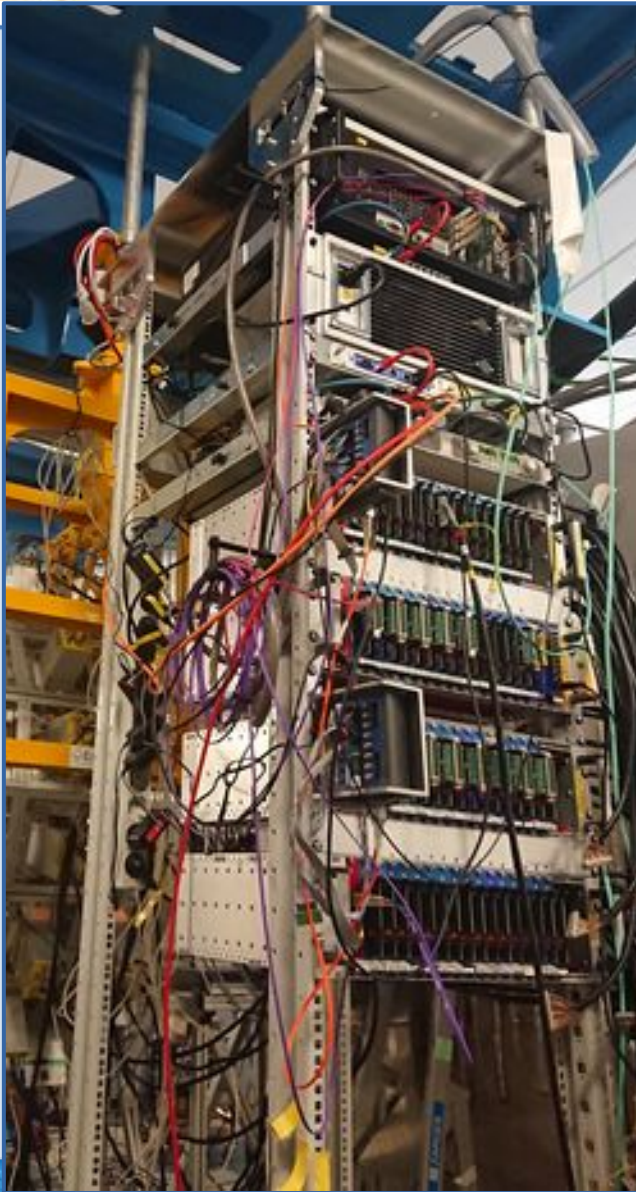
Barrel:

- Half filled (Ring 3&4)
- Readout with Single Range (300/30 MeV) Preamps

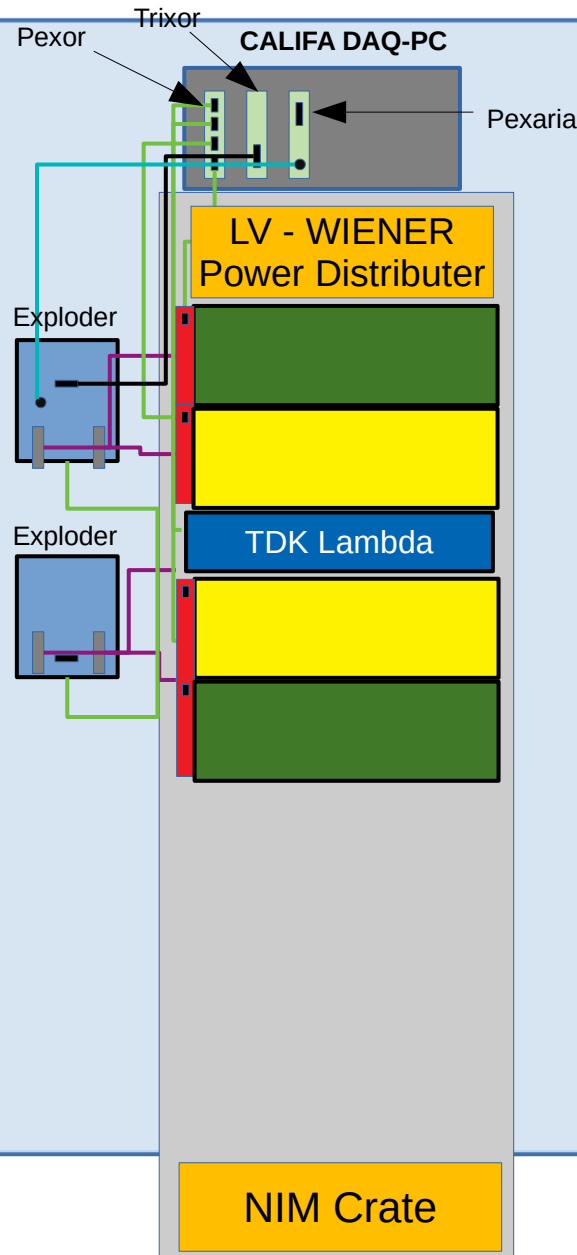
Pulser:

- 2 SR 100/10 MeV Preamps
- For deadtime/sync checking

CALIFA DAQ Status (S522, 2022)



Tobias Jenegger



Electronic Rack

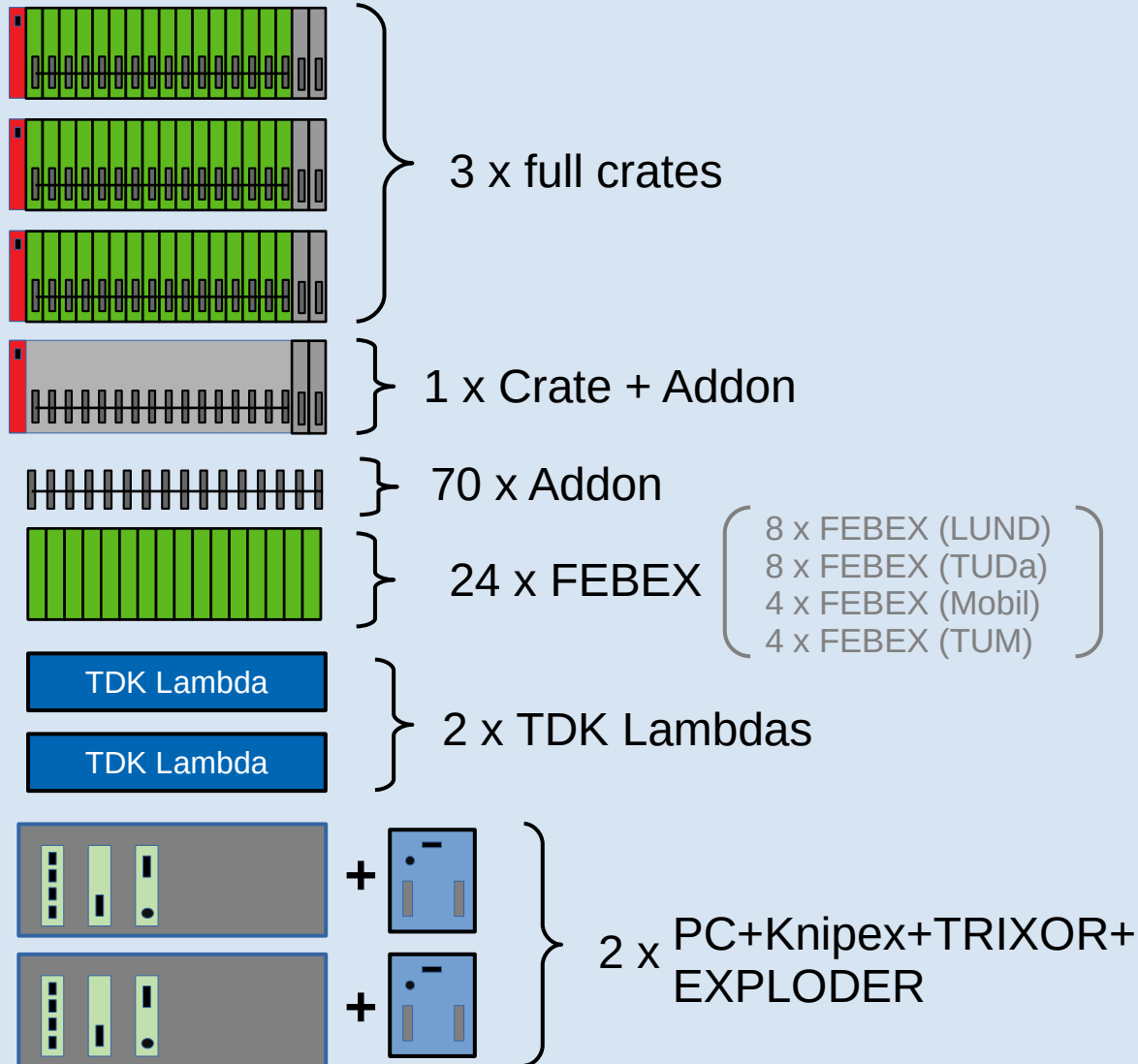
- 8 Crates (each with 18 x FEBEX + Addon)
- 2 PCs (with Knipex+TRIXOR)
- 2 TDK Lambda
- 4 Exploder
- 1 “Overlord” Exploder
- 2 Slow Control PCs

Cables

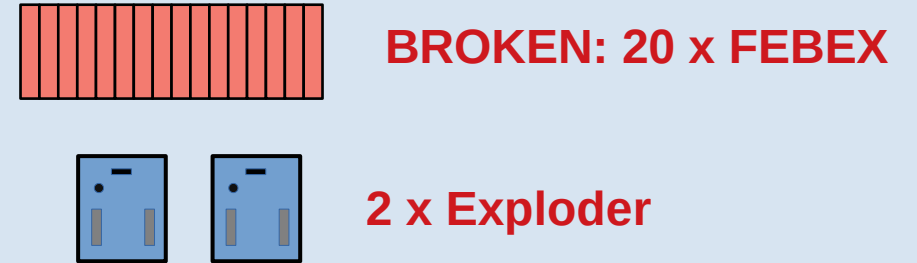
- 32 SCSI data cables (iPhos)
- 64+2 SR data cables (Barrel)
- 48 LV power cables

What do we have still in Stock?

Stock



Missing compared to order status



What we found again

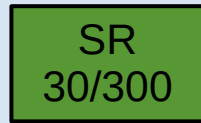


Stock

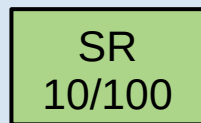
Missing compared to order status



} 8 x 30/300 DR32



} 4 x 30/300 SR32



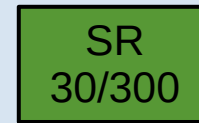
} 5 x 10/100 SR32



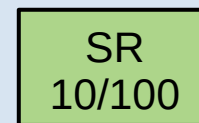
} 8 x SCSI Cables



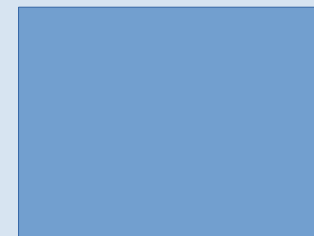
} **1 x 30/300 DR32**



} **6 x 30/300 SR32**



} **5 x 10/100 SR32**

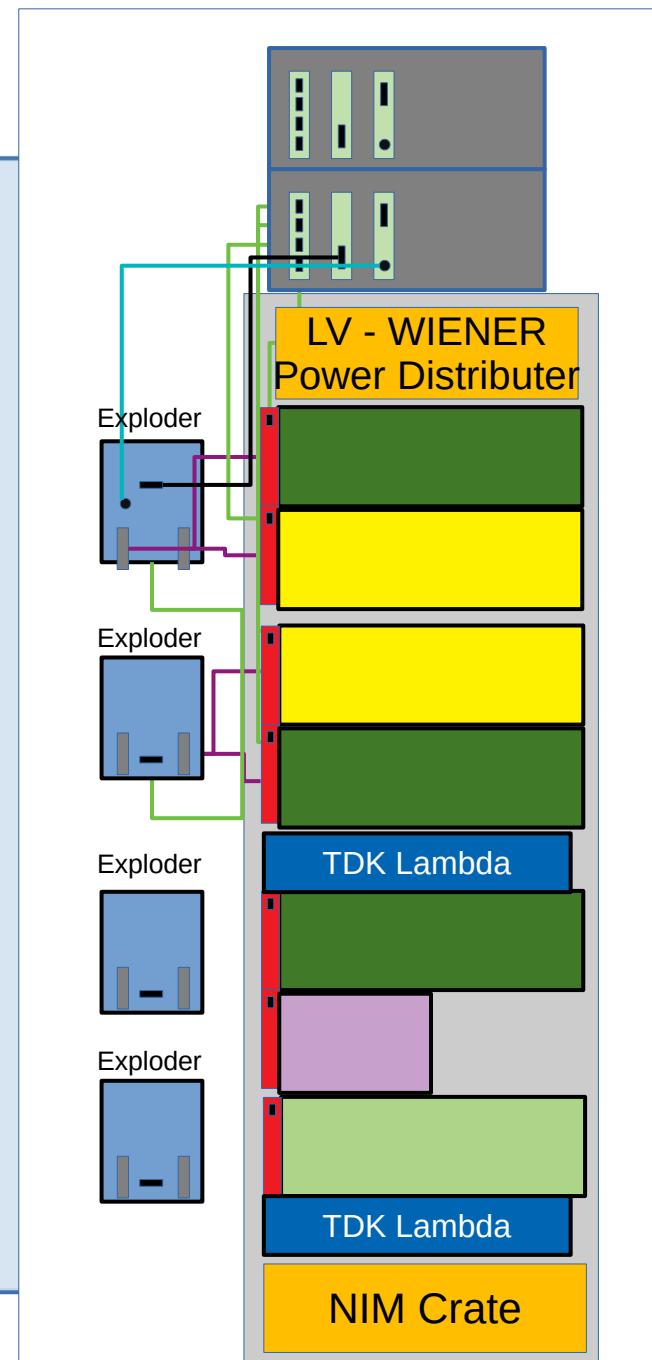


} **11 x Single Cables**

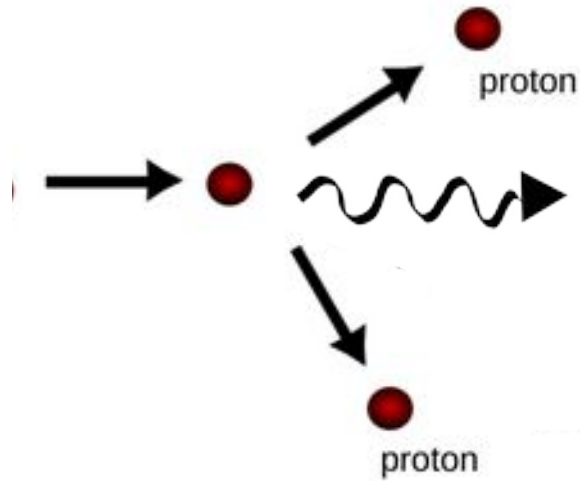
Possible Electronics Configurations

Default Configuration

CEPA	iPhos	Ring 4	Ring 3	Ring 2	Ring 1
	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 48 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 48 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 48 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 48 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100

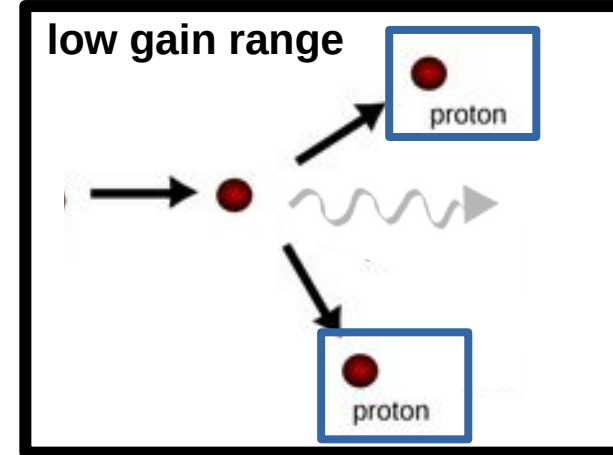


Dual Range Preamplifier

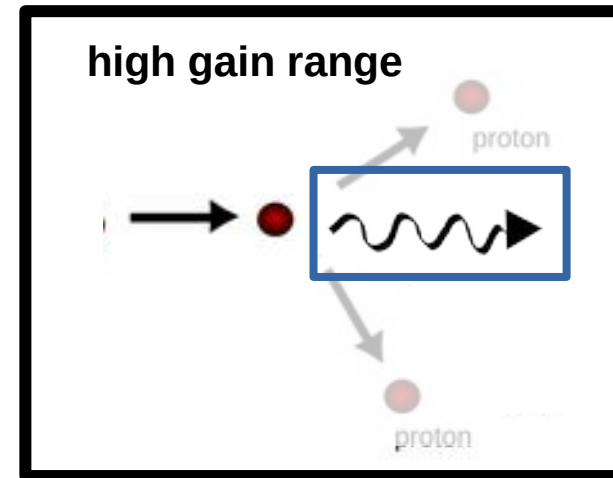


SIMULTANEOUS
high energetic particle
measurement
&
gamma spectroscopy

SingleRange Preamplifier



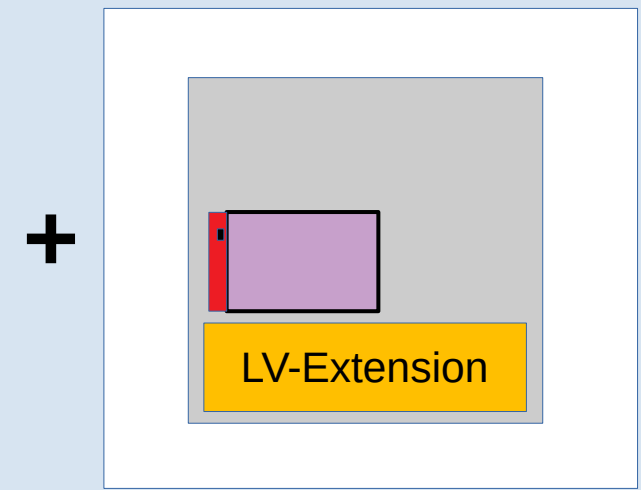
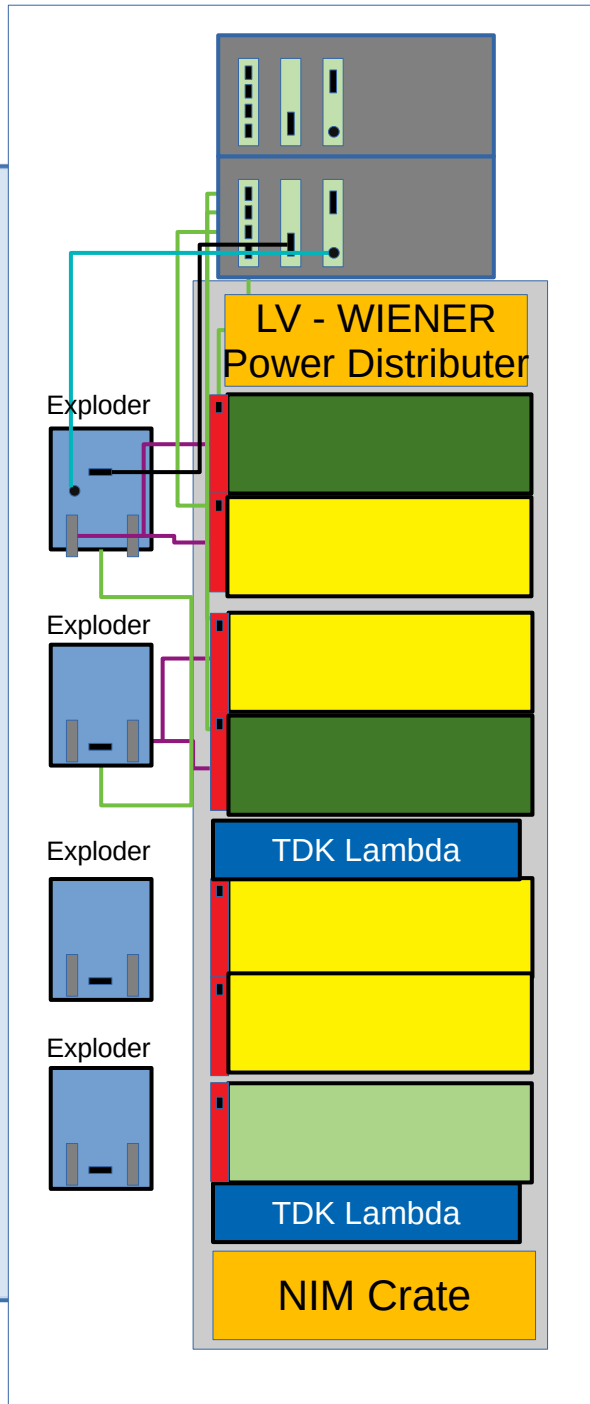
OR



experiment dependent decision has
to be taken beforehand!

4π Configuration

CEPA	iPhos	Ring 4	Ring 3	Ring 2	Ring 1
	DR 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300
	DR 30/300	DR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 48 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 48 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 48 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 48 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300
	DR 30/300	DR 30/300	SR 30/300	SR 30/300	SR 10/100

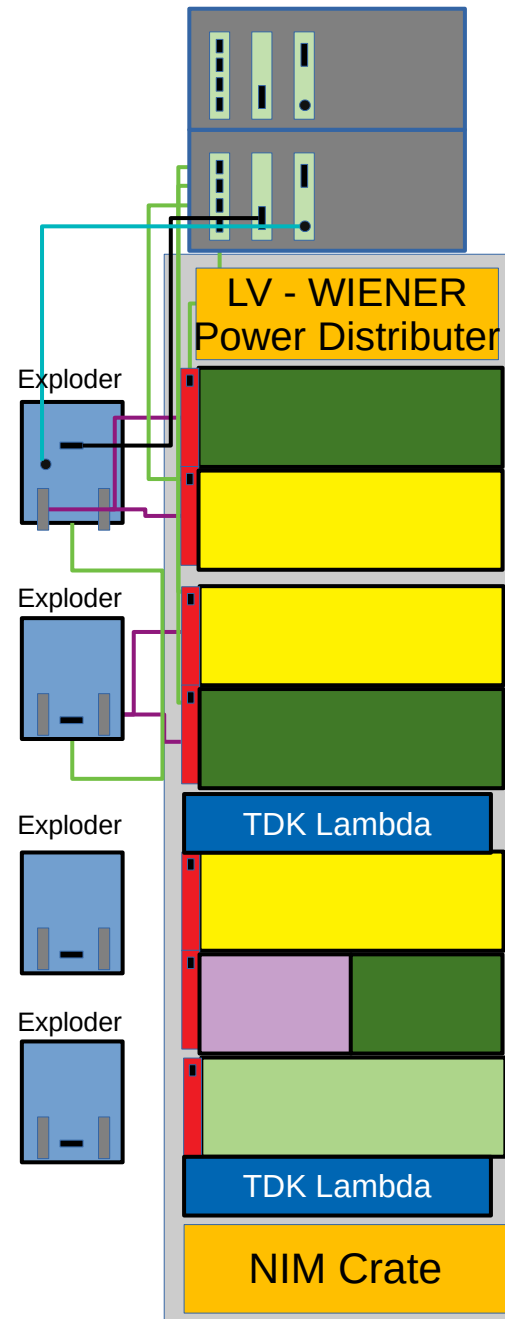


Second Rack on each side needed!

Mixed Configuration

CEPA iPhos Ring 4 Ring 3 Ring 2 Ring 1

	DR 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
	DR 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 48 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 48 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 48 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 48 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100
DR 30/300	DR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 30/300	SR 10/100



► Load Balancing

Comparison

Default Config.

Workload:

- Minimum DAQ effort
- Find missing 18 x FEBEX
- Find 2 missing EXPLODERS
- Modify 12DR32 into 8xDR48 (16k€)

Orders:

- 12 x SR32 30/300 (60 k€)
- 11 x SR32 10/100 (55 k€)
- + 3 spares (15 k€)
- Modify 2 FEBEX CRATES (4 k€)

Sum: 150 k€



As planned



Issues with punch through at 42-60°

4π Config.

Workload:

- Minimum DAQ effort
- Find missing 18 x FEBEX
- Find 2 missing EXPLODERS

Orders:

- 8 x DR 48 30/300 (60 k€)
- 8xSR32 30/300 10/100 (40 k€)
- 11 x SR32 10/100 (55 k€)
- + 3 spares (15 k€)
- Modify 4 FEBEX CRATES(8 k€)
- 10 new FEBEX Cards (12 k€)
- LV Extension (20k€)

Sum: 200 k€



All features in - 4π save



More data, less spares
Two more racks needed

Mixed Config.

Workload:

- Some DAQ effort
- Find missing 18 x FEBEX
- Find 2 missing EXPLODERS
- Modify 16xSR-DR mixed (16k€)

Orders:

- 8 x DR 48 30/300 (60 k€)
- 8 x SR32 30/300 10/100 (40 k€)
- + 3 spares (15 k€)
- Modify 2 FEBEX CRATES (4 k€)

Sum: 140 k€



All features in - 4π save



More modifications
@ Mesytec



Thank you!

CALIFA @ Technical University of Munich (TUM)

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