

# CALIFA DAQ

## Readout and Electronics status update

Tobias Jenegger

R<sup>3</sup>B Week May 2023

Current Status

Filling CEPA

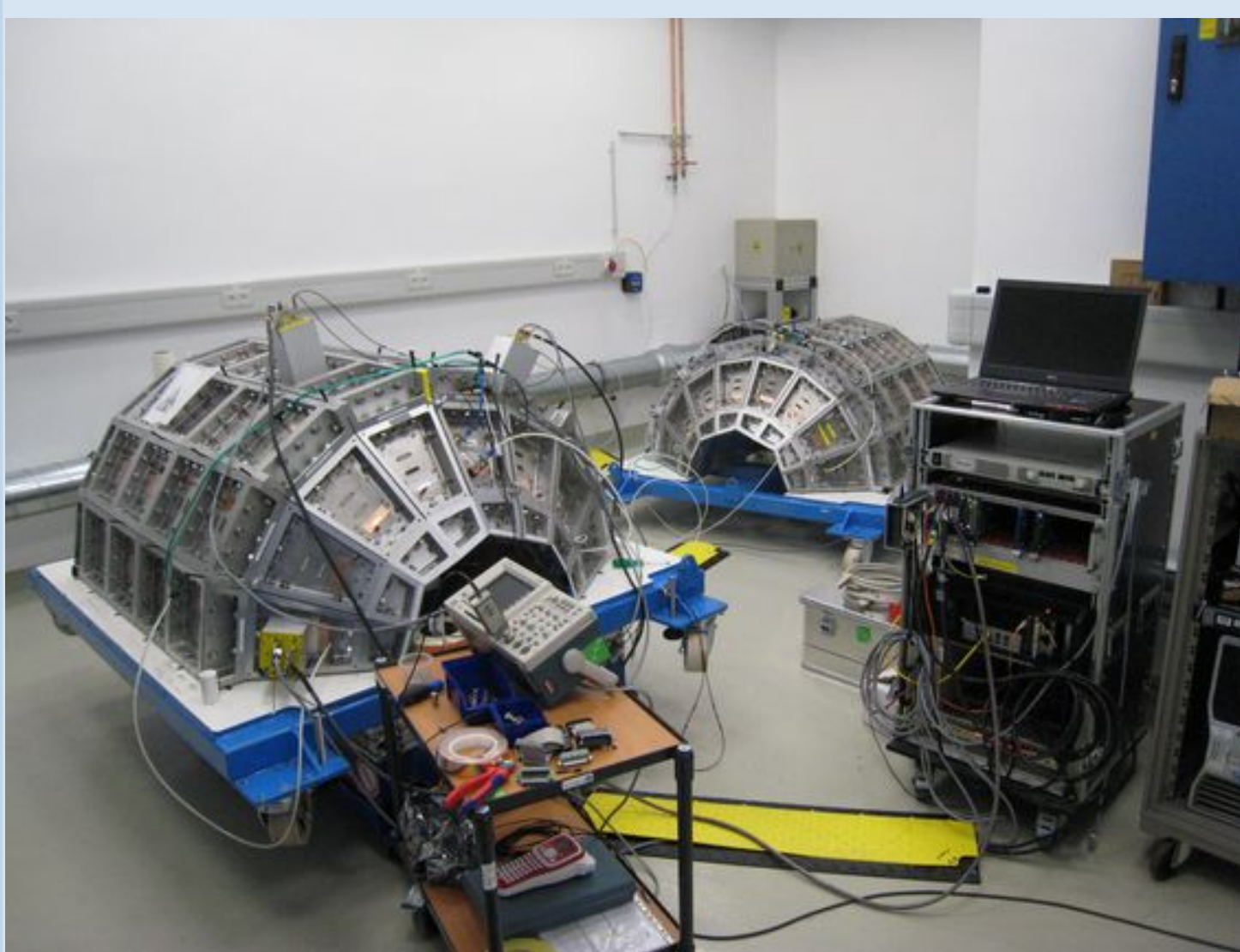
Final Electronics Configuration

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

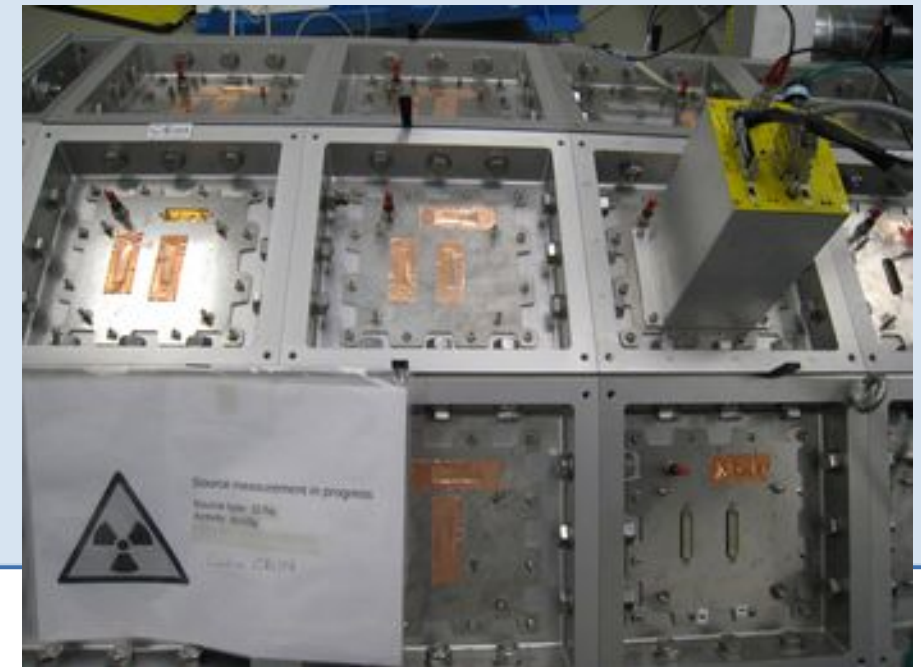
# Where is CALIFA?







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

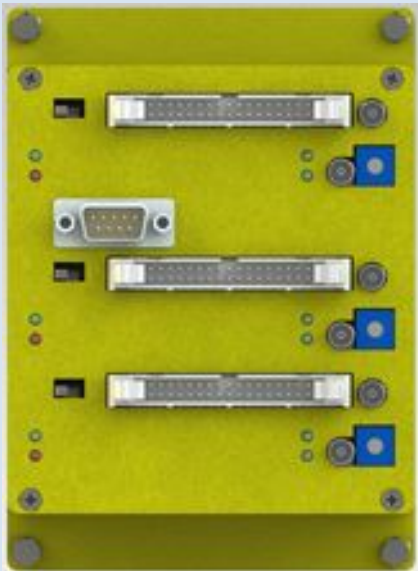


# Filling CEPA

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

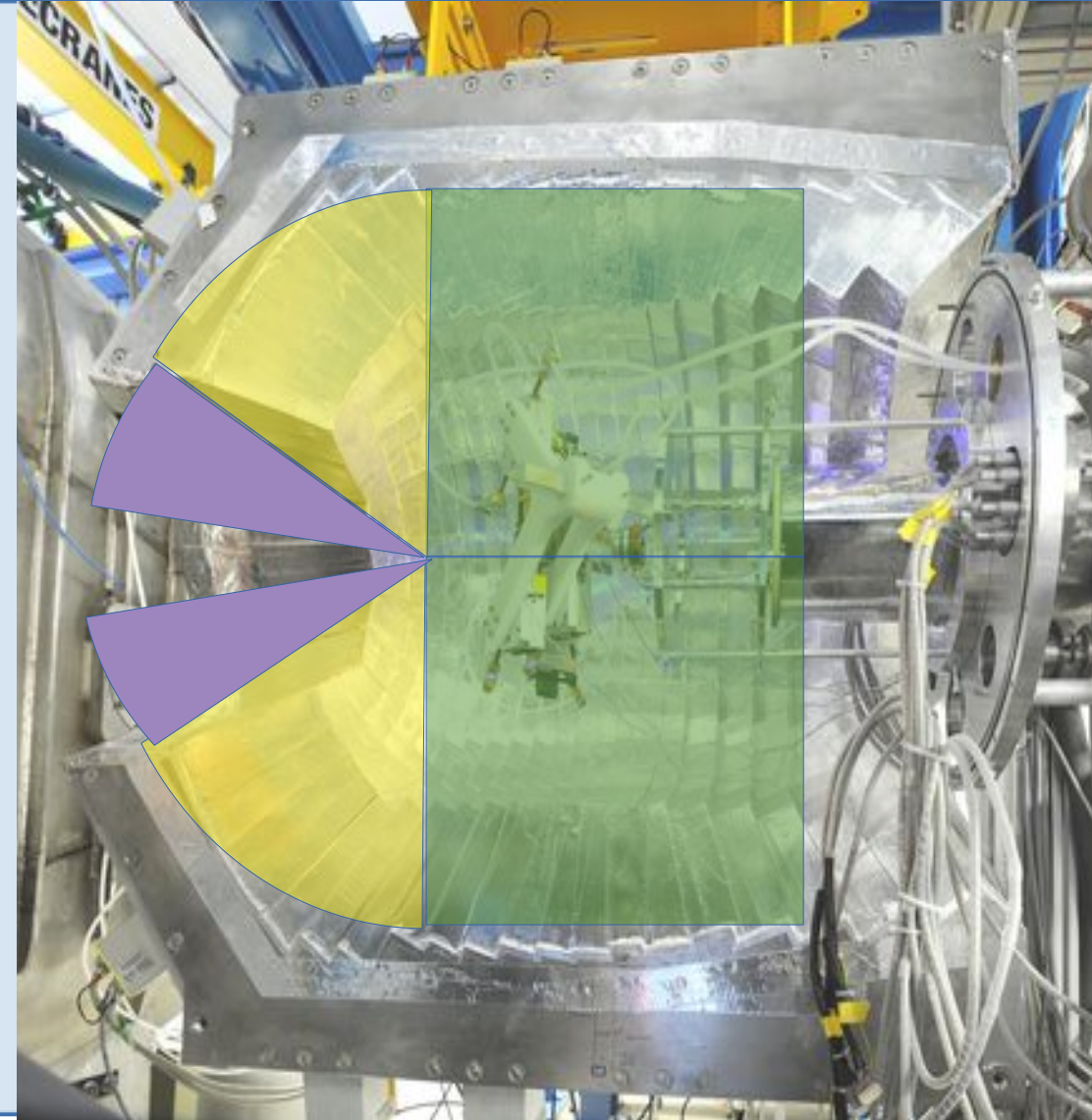
## Mesytec MPRB-48 Dual Range Preamps

They get mounted on iPhos tiles

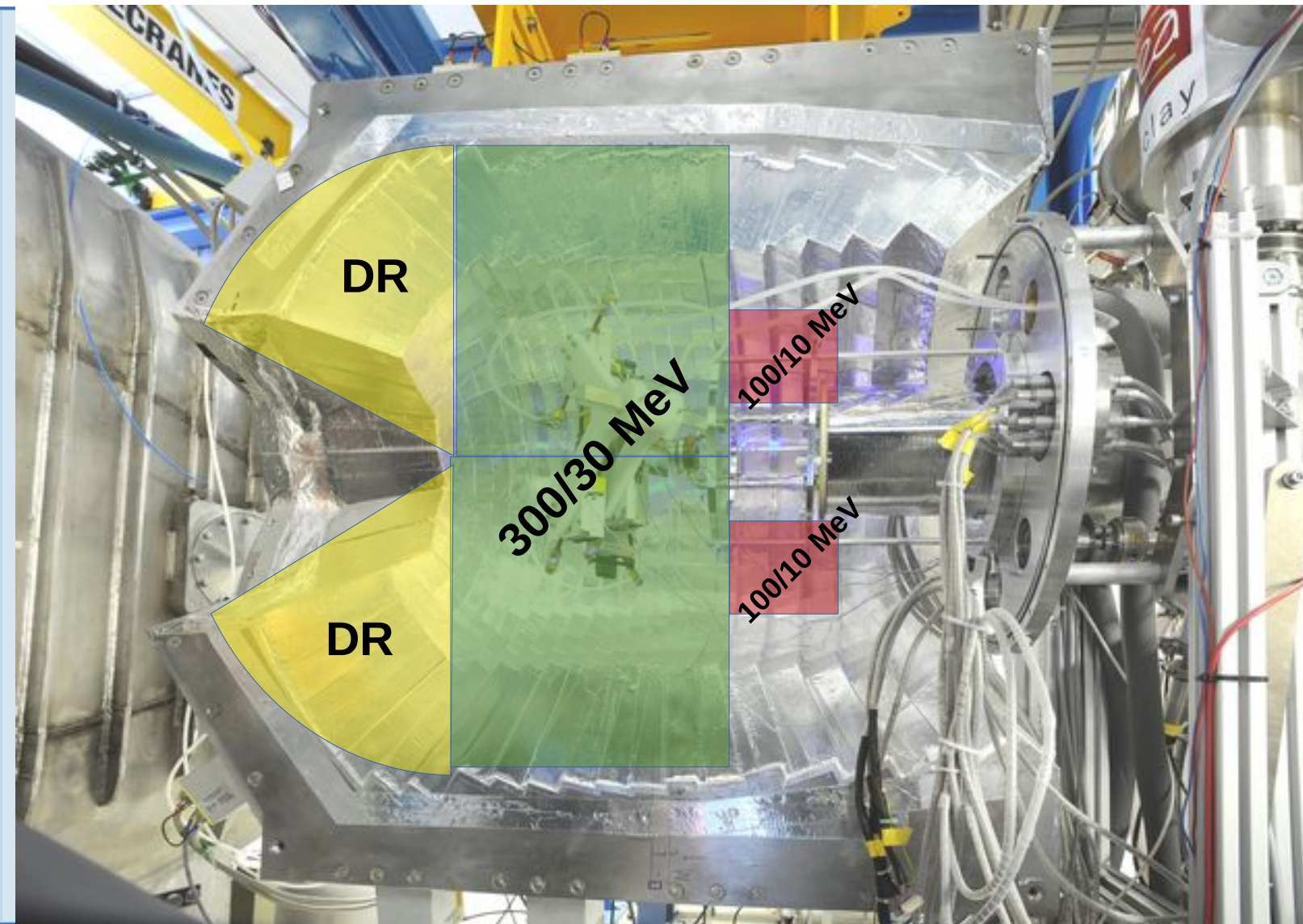


Connected to iPhos APDs  
(32 channels)

Connected to CEPA APDs  
(16 channels)







## iPhos:

- completely filled
- readout with Dual Range Preamps

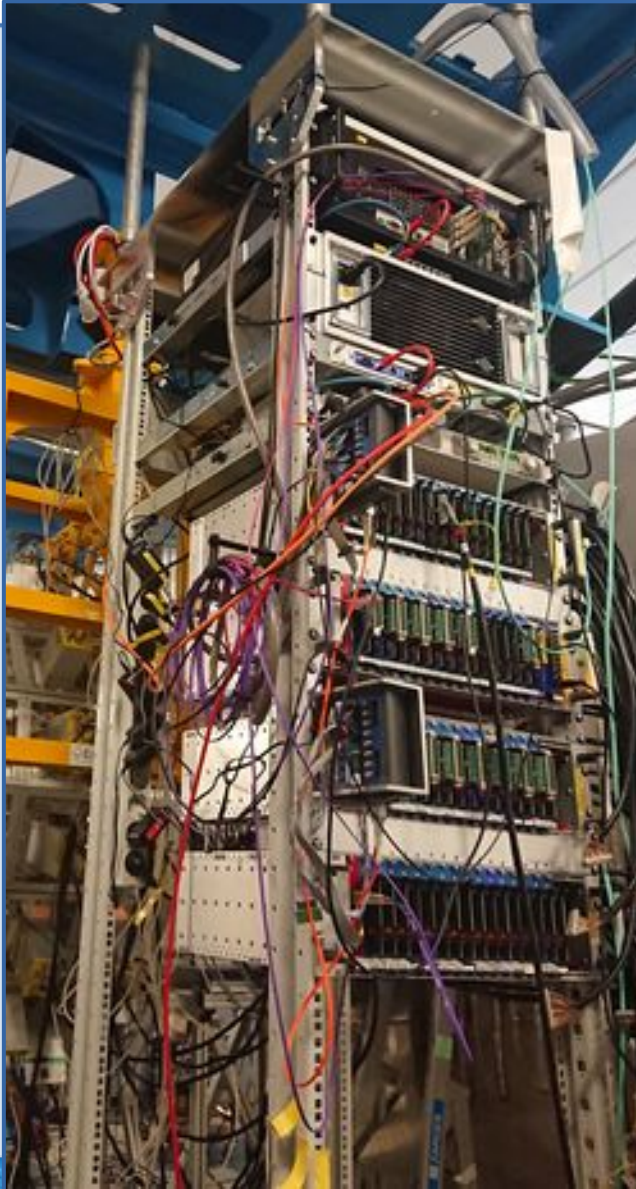
## Barrel:

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

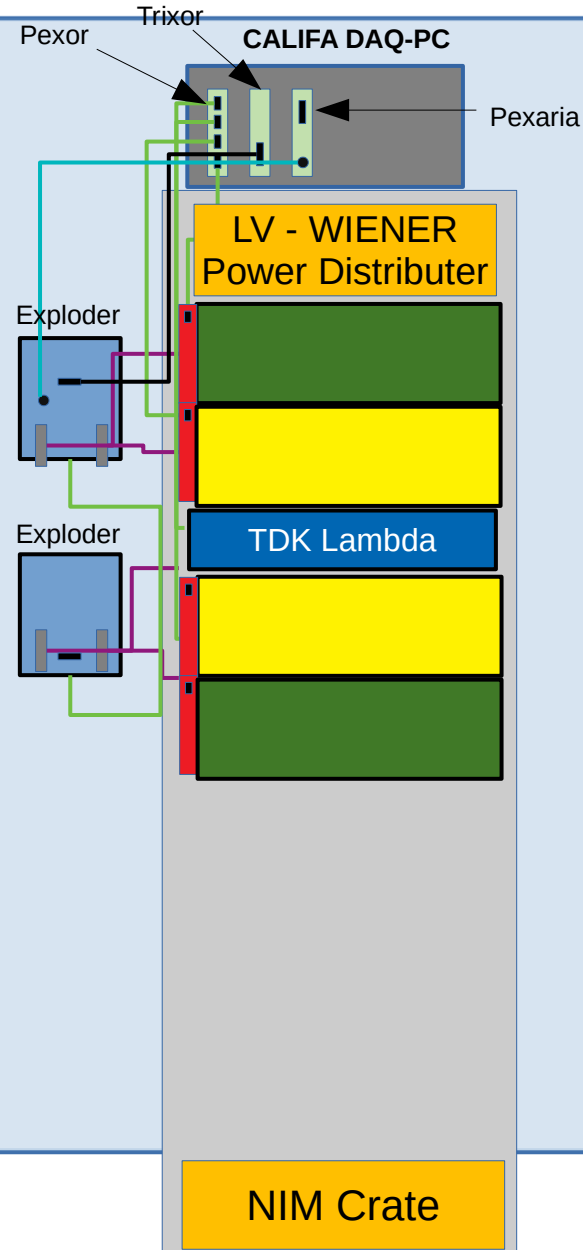
## Pulser:

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

# CALIFA DAQ Status (S522, 2022)



Tobias Jenegger



## Electronic Rack

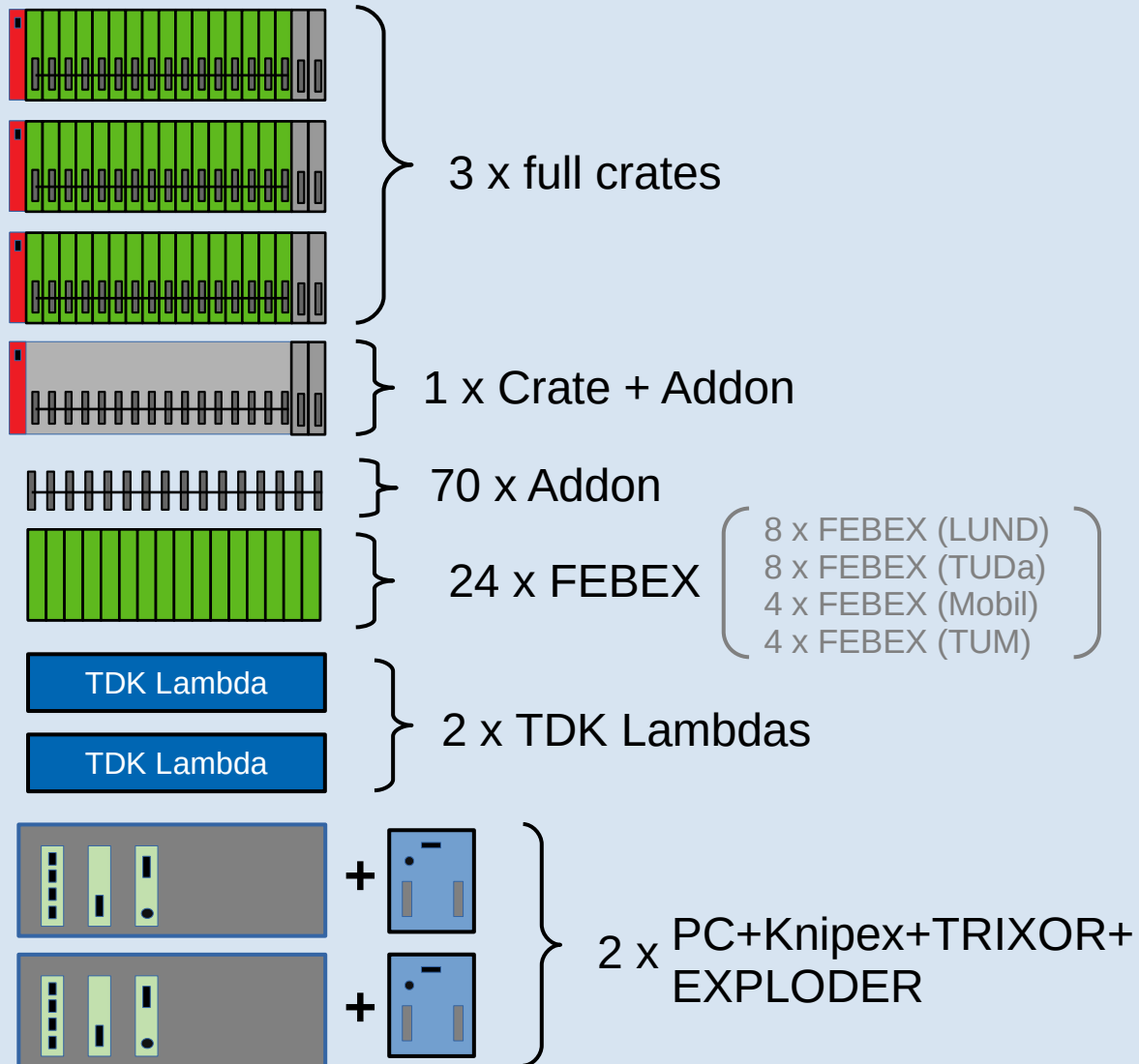
- 8 Crates (each with 18 x FEBEX + Addon)
- 2 PCs (with Knipex+TRIXOR)
- 2 TDK Lambda
- 4 Exploder
- 1 “Overlord” Exploder
- 2 Slow Control PCs

## Cables

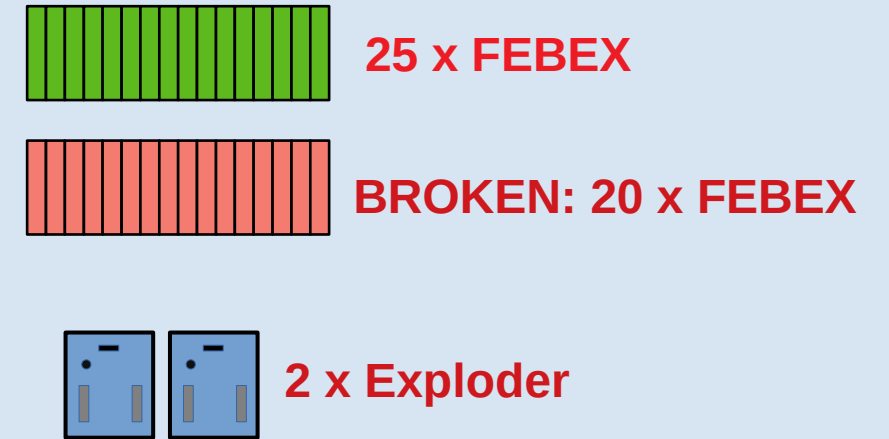
- 32 SCSI data cables (iPhos)
- 64+2 SR data cables (Barrel)
- 48 LV power cables

# What do we have still in Stock?

## Stock



## Missing compared to order status



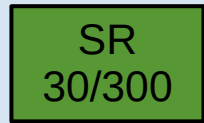


## Stock

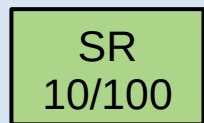
## Missing compared to order status



8 x 30/300 DR32



4 x 30/300 SR32



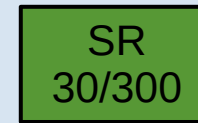
5 x 10/100 SR32



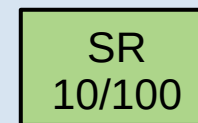
8 x SCSI Cables



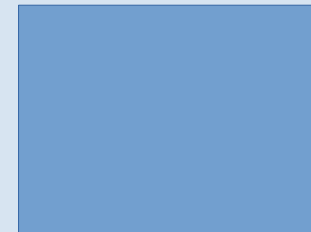
1 x 30/300 DR32



6 x 30/300 SR32



5 x 10/100 SR32



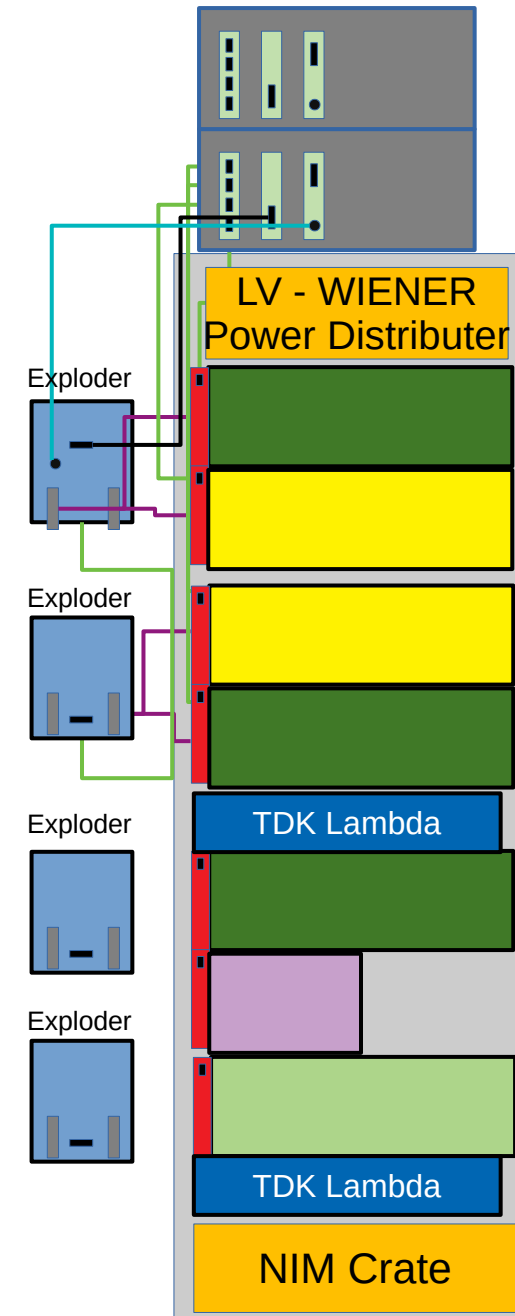
11 x Single Cables

# Possible Electronics Configurations

# Default Configuration

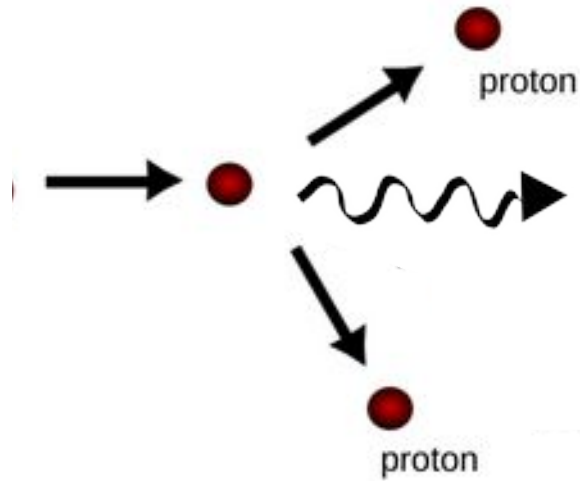
CEPA iPhos Ring 4 Ring 3 Ring 2 Ring 1

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



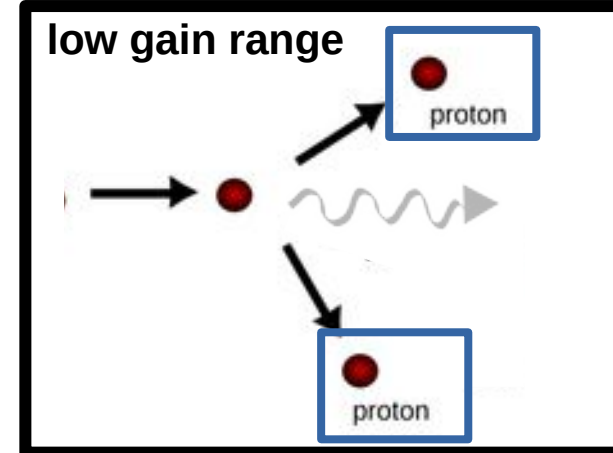


## Dual Range Preamplifier

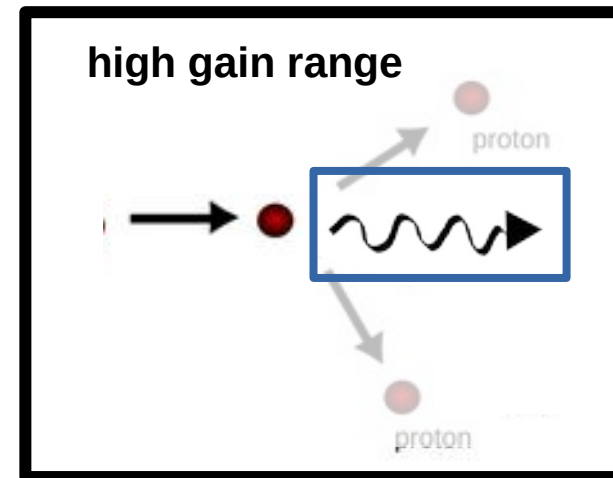


**SIMULTANEOUS**  
high energetic particle  
measurement  
&  
gamma spectroscopy

## SingleRange Preamplifier



**OR**

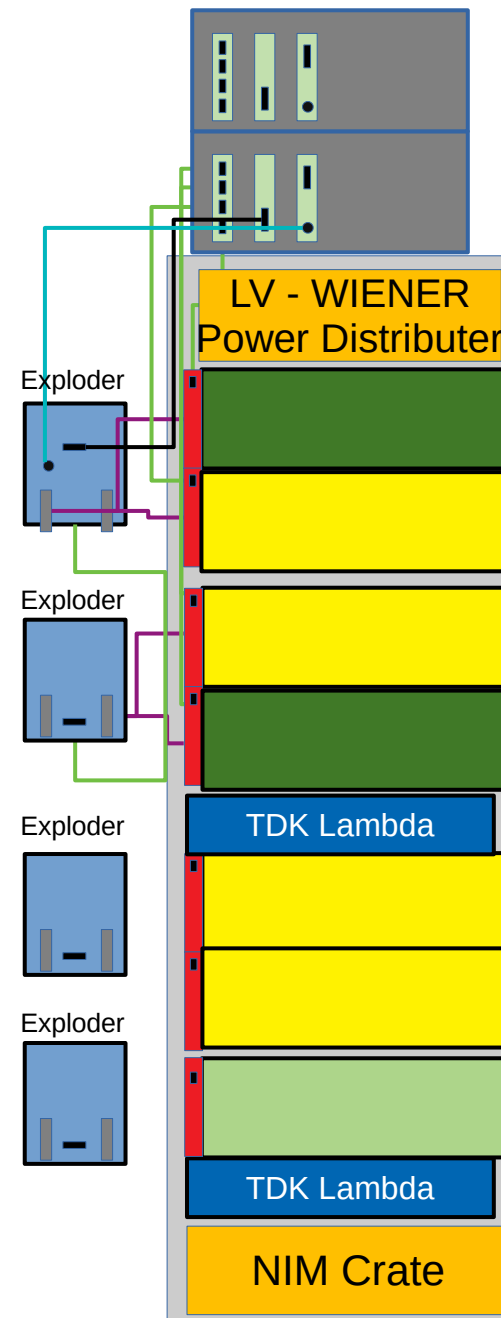


experiment dependent decision has  
to be taken beforehand!

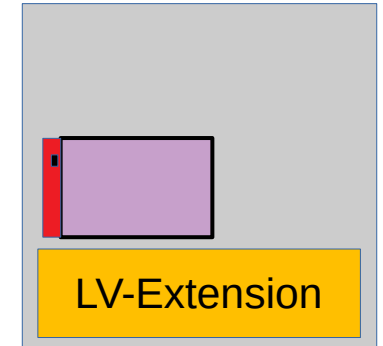
# 4 $\pi$ Configuration

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	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	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
DR 30/300	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

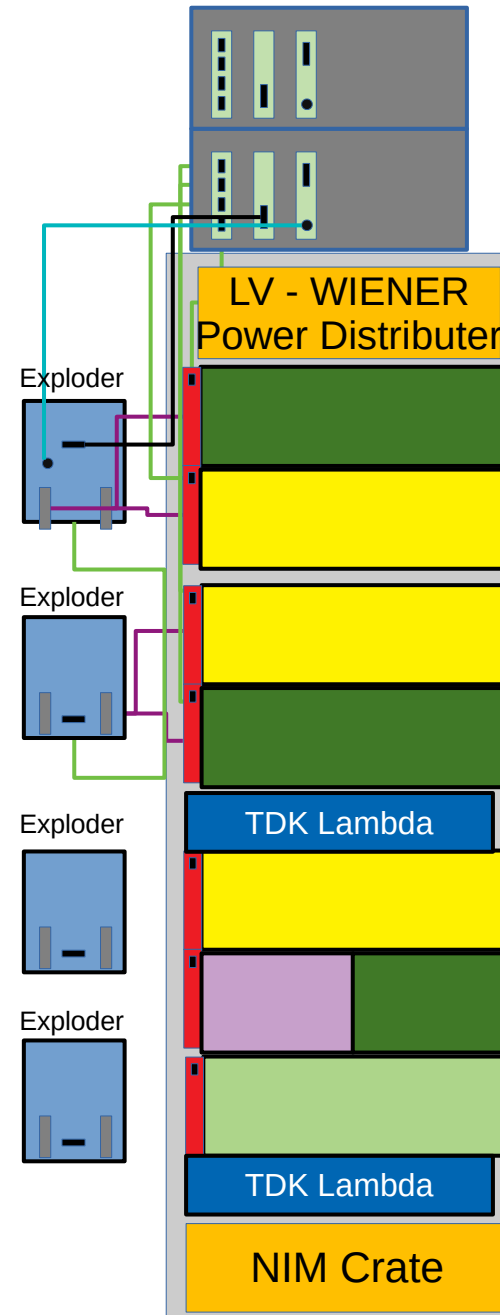
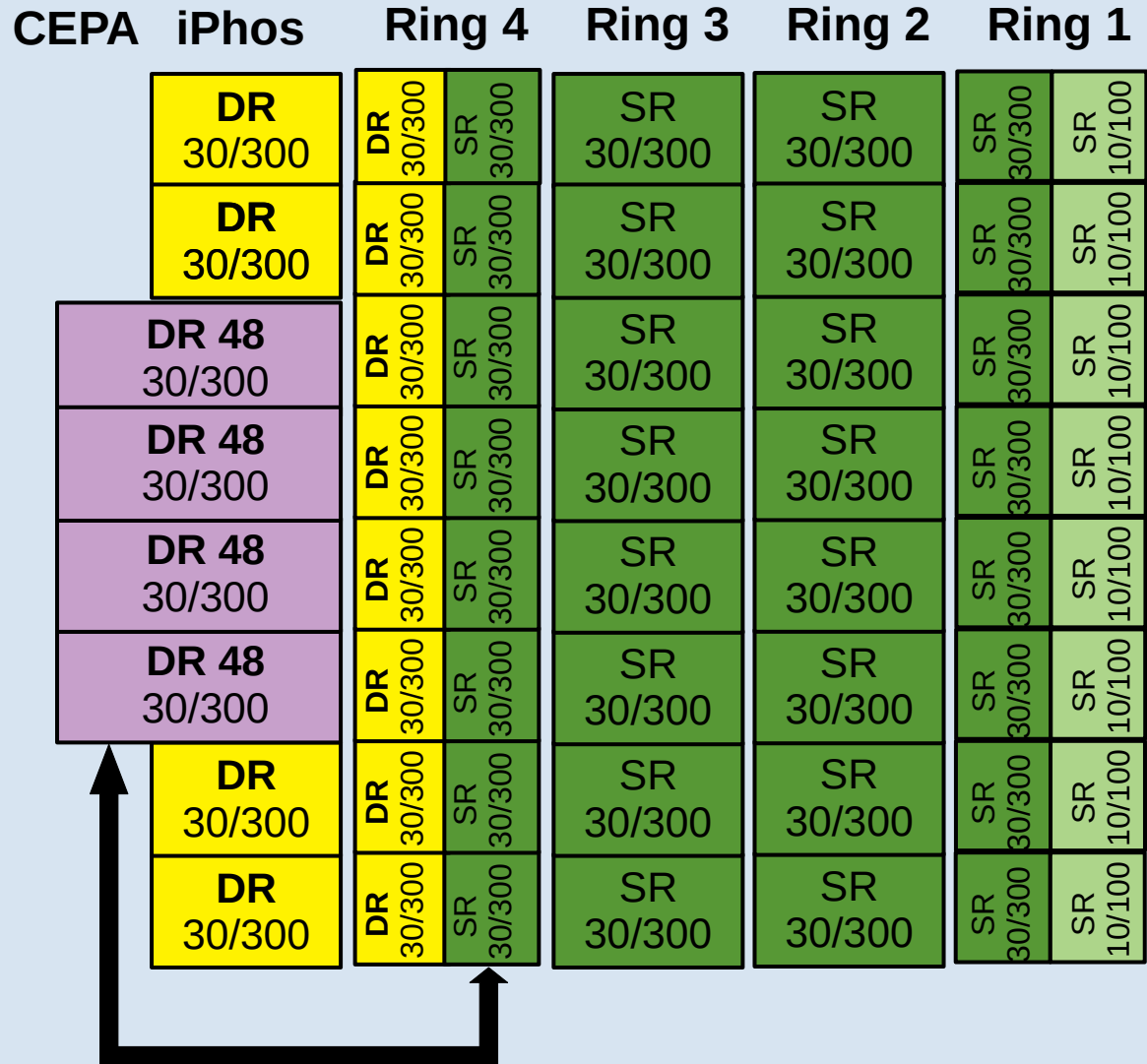


+



**Second Rack on each side needed!**

# Mixed Configuration



➔ 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€)
- 18 new FEBEX Card (20 k€)

Sum: **170k€**



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€)
- 54 new FEBEX Cards (60 k€)
- LV Extension (20k€)

Sum: **248k€**



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€)
- 36 new FEBEX Cards (40k€)

Sum: **180k€**



All features in - 4π save



More modifications  
@ Mesytec



# Thank you!

**CALIFA @ Technical University of Munich (TUM)**

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