

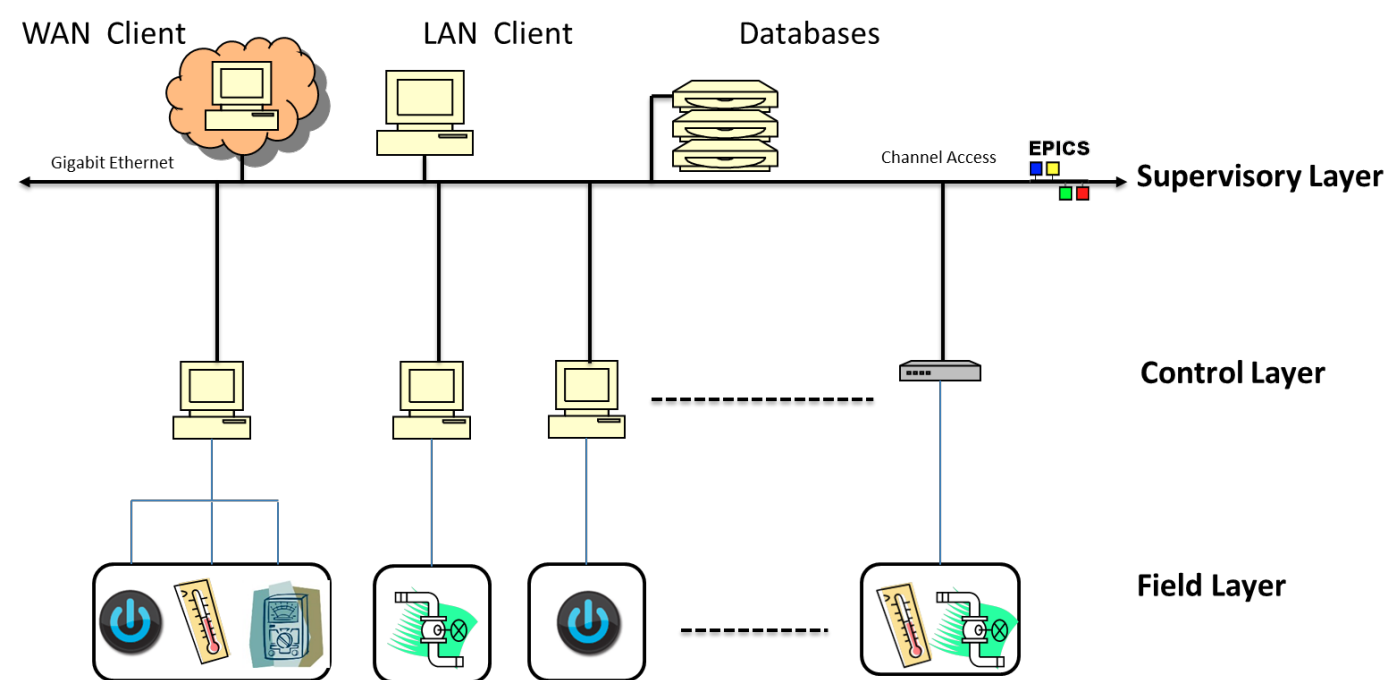
# A model for collecting, archiving and online analysis of EDD slow parameters

PANDA Collaboration meeting November 2019

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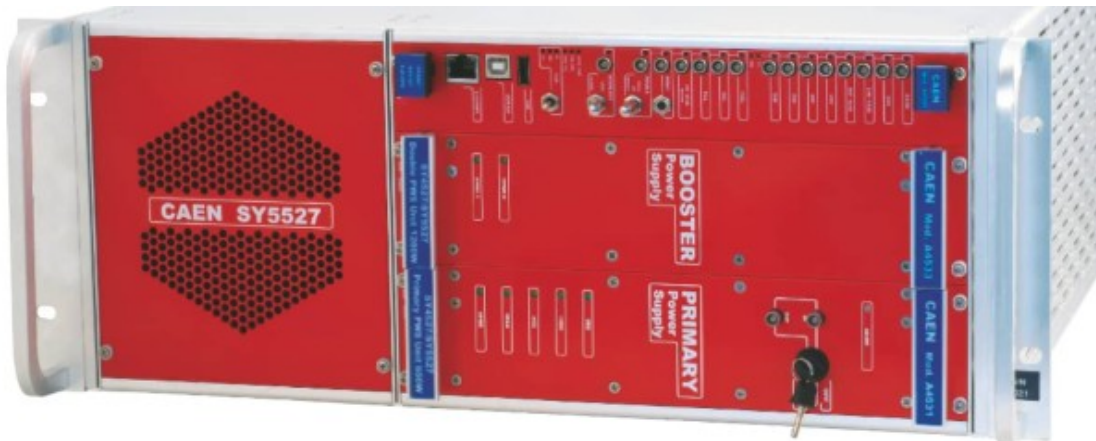
IPII JLU Gießen

# The scheme and advice from PANDA DCS web



- Because the device driver software support in EPICS is limited, the software development tools used to control **the lowermost layer (Field Layer)** are at the free choice of the **developer**. The only constrain here is that the software must be integrated in the control layer with the EPICS system. However, the recommendation is that the developer, in the early stages of design, should try implement, were is possible, the same hardware and software, with EPICS support, realized by other PANDA sub-systems.

# The first final EDD device's



CAEN  
create  
SY 5527B



AG 7435SN

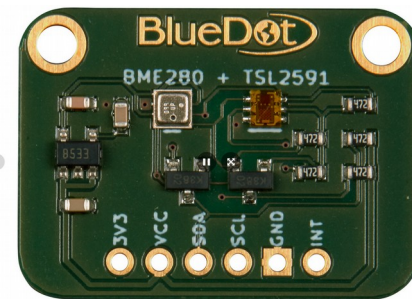
We can supply the GCS  
PMT's (~1kV) or  
MCP's (up to 3.5kV)  
and this  
Module could supply 1 EDD  
quadrant



A 2519

We use this module  
To supply the TofPET  
DAQ and our homemade  
Modules 5-15V

And Marc Wetter-station  
P,T, Humidity, Light, Motion  
Installed in clean room  
Using RasPI



# EDD yet only final hardware CAEN SY5427 Power supply

GEDCO2020

File Settings Groups Window Help

**GEDCO: General control software**

SYSTEM

**SY4527** Disconnect Configure

SY5527  
UNIVERSAL MULTICHANNEL  
POWER SUPPLY SYSTEM

134.176.17.196

SETTINGS

ADVANCED FEATURES

SESSIONS	CRATE MAP	TECH INFO	SYS INFO
RESET FLAG CFG	GEN SIGN CFG	KILL	CLEAR ALARM

Channel ON ☐

OVV ☐

UNV ☐

OVC ☐

Trip ☐

HVFanStat Fan0 ☐ 2360

Fan1 ☐ 2360

SymbolicName SystemOne

HVFanSpeed

PWFanStat Fan0 ☐ 1680

SY4527

Custom	Name	IOSet	V0Set	IMon	VMon	Pw	Stat
00.000	CHANNEL00	355.00 uA	900.000 V	0.000 uA	0.000 V	Off	
00.001	CHANNEL01	355.00 uA	900.000 V	0.000 uA	0.000 V	Off	
00.002	CHANNEL02	355.00 uA	900.000 V	0.000 uA	0.000 V	Off	
00.003	CHANNEL03	355.00 uA	900.000 V	0.000 uA	0.000 V	Off	
00.004	CHANNEL04	355.00 uA	900.000 V	0.000 uA	0.000 V	Off	
00.005	CHANNEL05	355.00 uA	900.000 V	0.000 uA	0.000 V	Off	
00.006	CHANNEL06	355.00 uA	900.000 V	0.000 uA	0.000 V	Off	
00.007	CHANNEL07	355.00 uA	900.000 V	0.000 uA	0.000 V	Off	
00.008	CHANNEL08	500.00 uA	0.000 V	0.000 uA	0.000 V	Off	
00.009	CHANNEL09	1500.00 uA	1000.000 V	0.000 uA	0.000 V	Off	
00.010	CHANNEL10	355.00 uA	0.000 V	0.000 uA	0.000 V	Off	
00.011	CHANNEL11	355.00 uA	0.000 V	0.000 uA	0.000 V	Off	
00.012	CHANNEL12	355.00 uA	0.000 V	0.000 uA	0.000 V	Off	
00.013	CHANNEL13	355.00 uA	0.000 V	0.000 uA	0.000 V	Off	
00.014	CHANNEL14	355.00 uA	0.000 V	0.000 uA	0.000 V	Off	
00.015	CHANNEL15	355.00 uA	0.000 V	0.000 uA	0.000 V	Off	
00.016	CHANNEL16	355.00 uA	0.000 V	0.000 uA	0.000 V	Off	
00.017	CHANNEL17	355.00 uA	0.000 V	0.000 uA	0.000 V	Off	

BOARDS

Board00 - AG7435SN - [76]

AG7435SN Module

BdStatus ☐

HVMMax 3578 V

HIMax 4032 uA

Temp 29 °C

Clr Alarm

Board03 - A2519 - [197]

A2519 Module

BdStatus ☐

OnGroup 0

OffGroup 0

IntckA

IntckB

Clr Alarm

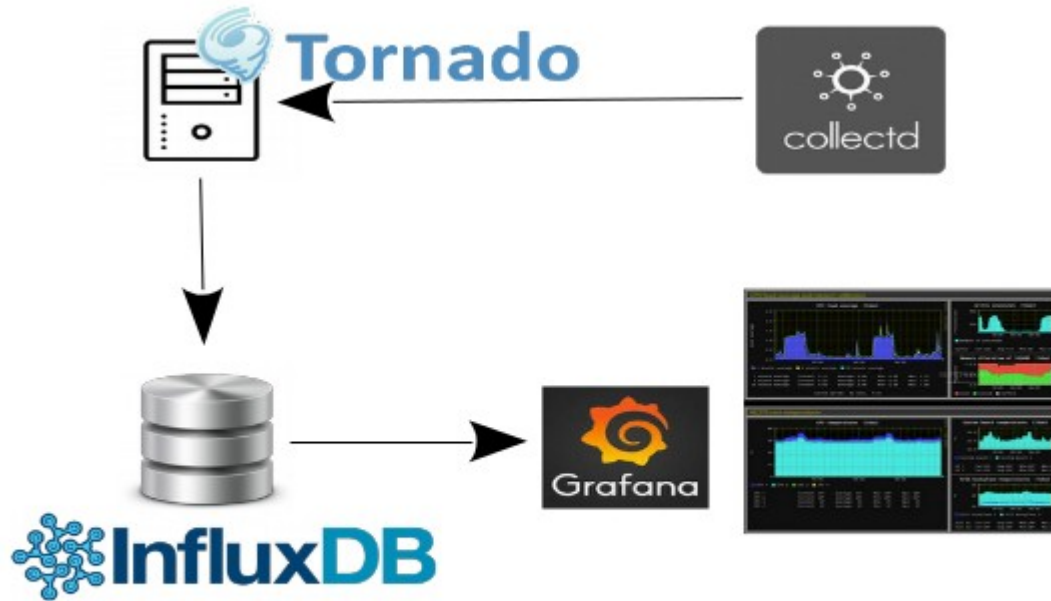
The Control layer of our system.

# EDD yet only final hardware CAEN SY5427 Power supply

PV Name	Unit	Status
GCS_CAEN:00:023:RUUp	ao	x
GCS_CAEN:00:023:RDWn	ao	x
GCS_CAEN:00:023:Trip	ao	x
GCS_CAEN:00:023:SVMax	ao	x
GCS_CAEN:00:023:VMon	ai	x
GCS_CAEN:00:023:IMon	ai	x
GCS_CAEN:00:023:Status	ai	x
GCS_CAEN:00:023:PW	bo	x
GCS_CAEN:00:023:POn	bo	x
GCS_CAEN:00:023:PDWn	bo	x
GCS_CAEN:00:023:ImRange	bo	x
GCS_CAEN:00:023:TriptInt	mbboDirect	x
GCS_CAEN:00:023:TriptExt	mbboDirect	x
GCS_CAEN:03:BdStatus	ai	x
GCS_CAEN:03:OnGroup	ao	x
GCS_CAEN:03:OffGroup	ao	x
GCS_CAEN:03:IntckA	bo	x
GCS_CAEN:03:IntckB	bo	x
GCS_CAEN:03:ClrAlarm	bo	x
GCS_CAEN:03:000:Name	stringout	x
GCS_CAEN:03:000:VOSet	ao	x
GCS_CAEN:03:000:IOSet	ao	x
GCS_CAEN:03:000:RUUpTime	ao	x
GCS_CAEN:03:000:RDWTime	ao	x
GCS_CAEN:03:000:UNVThr	ao	x

And its Supervisory layer....with EPICS running server and PV's  
(for the moment we name our PV's GCS, not as a PANDA\_EDD,  
naming scheme DCS require, but the change is straightforward)

# WEB based tools for EPICS embedded systems



This scheme was/is successfully  
Operational at BELLE2  
For example ECL monitoring

Figure 2: Data publishing architecture for EPICS PVs.

Our tested scheme on GCS is also similar to this one:



# Collecting data Telegraf

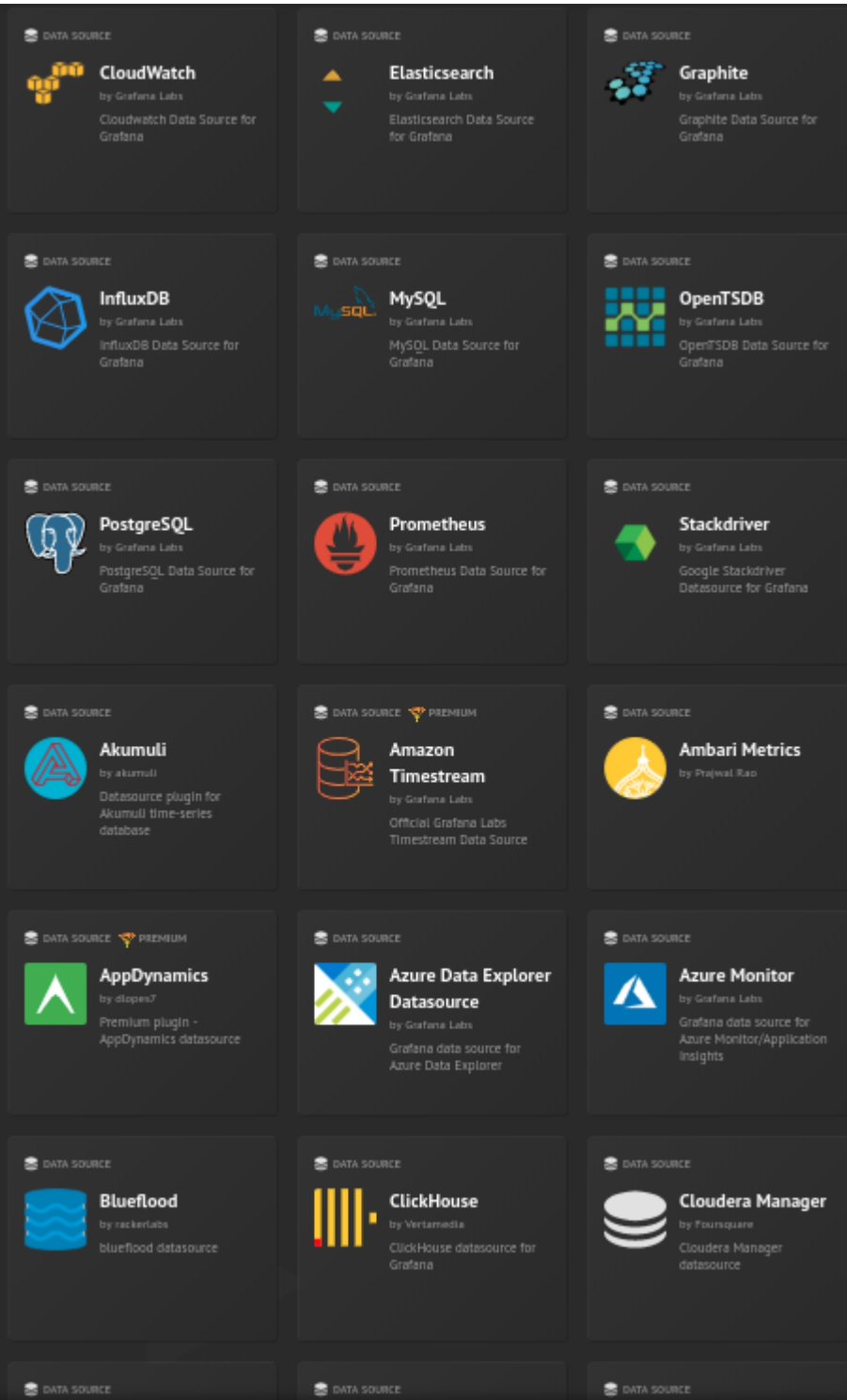
- Telegraf is an agent for collecting, processing, aggregating, and writing metrics.
- Design goals are to have a minimal memory footprint with a plugin system so that developers in the community can easily add support for collecting metrics.
- Connect to datasources like MongoDB, MySQL, Redis, and others to collect and send metrics.
- Systems: Collect metrics from your modern stack of cloud platforms, containers, and orchestrators.
- IoT sensors: Collect critical stateful data (pressure levels, temp levels, etc.) from IoT sensors and devices.

**Any Software we use should be open source!!!**

**<https://www.influxdata.com/time-series-platform/telegraf/>**



# TSDB DataBases-InfluxDB



From all possible DB, btw all are open source  
Our choice is InfluxDB which offers

**Real-time visibility  
into stacks, sensors and systems**

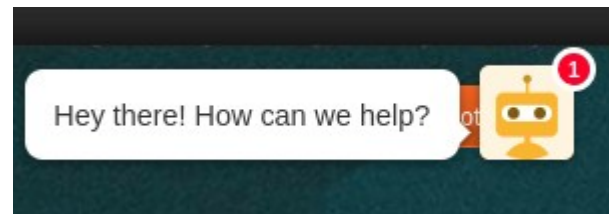
<https://www.influxdata.com/>



# Graphical representation Grafana

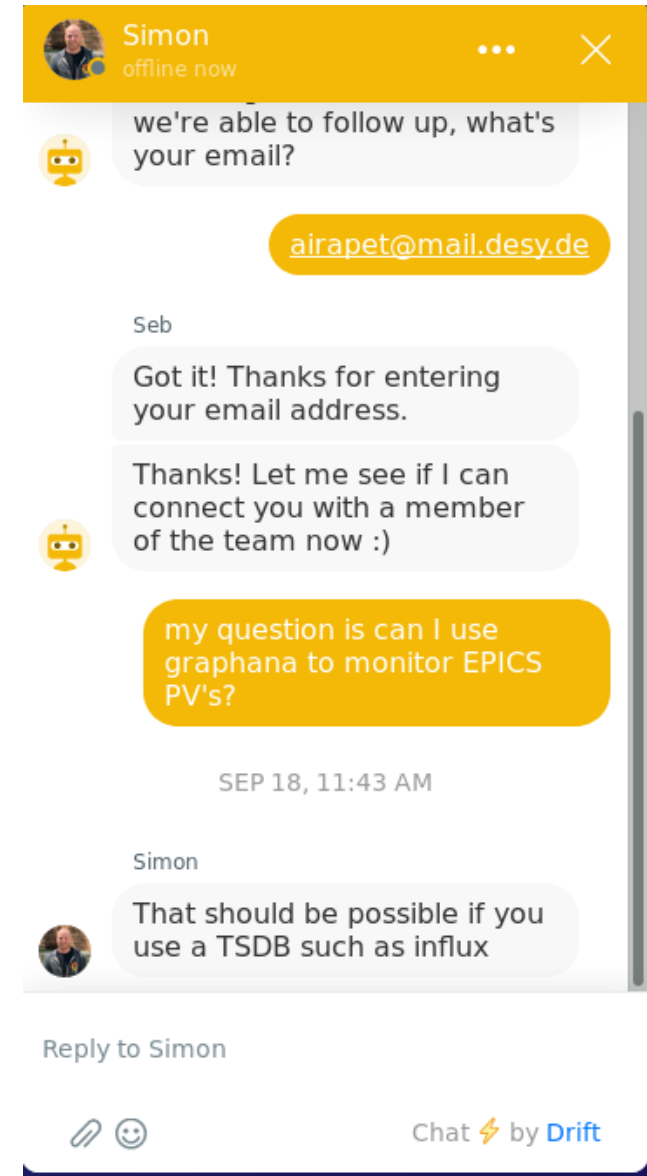
## The open observability platform

Grafana is the open source analytics & monitoring solution for every database

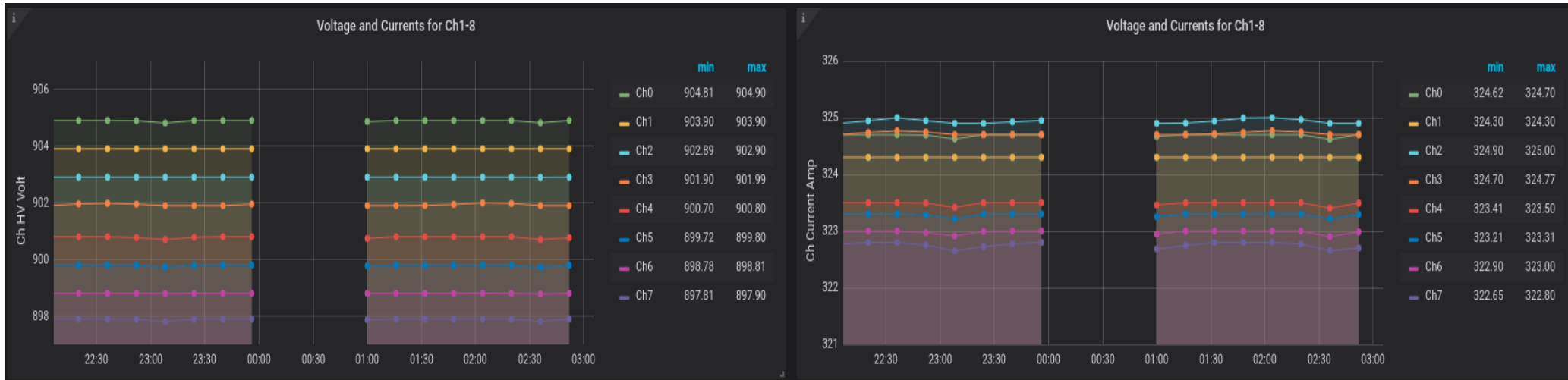


<https://grafana.com/>

Show online ongoing....



# The reason to create an Alert



At 23:50 **Alert** was created and sent to Jhonatan Pereira de Lira: “Jhonatan, the HV for the Trigger counters does not have a data, maybe they are OFF pls come and check the situation. GCS duty cycle is low.”



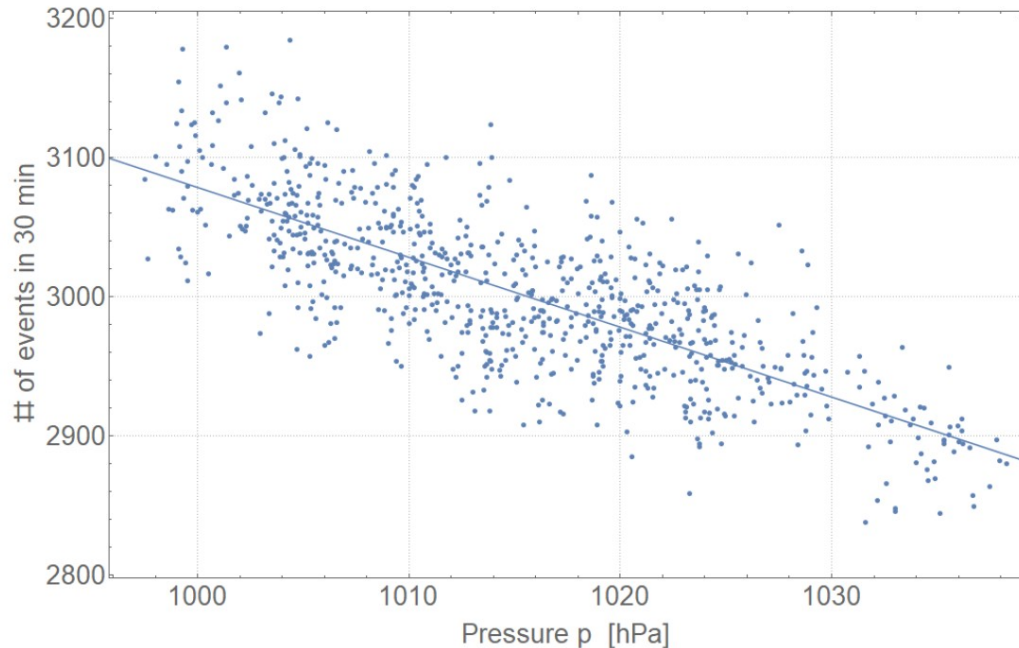
 Jhonatan Pereira de Lira

**Bachelorstudent**

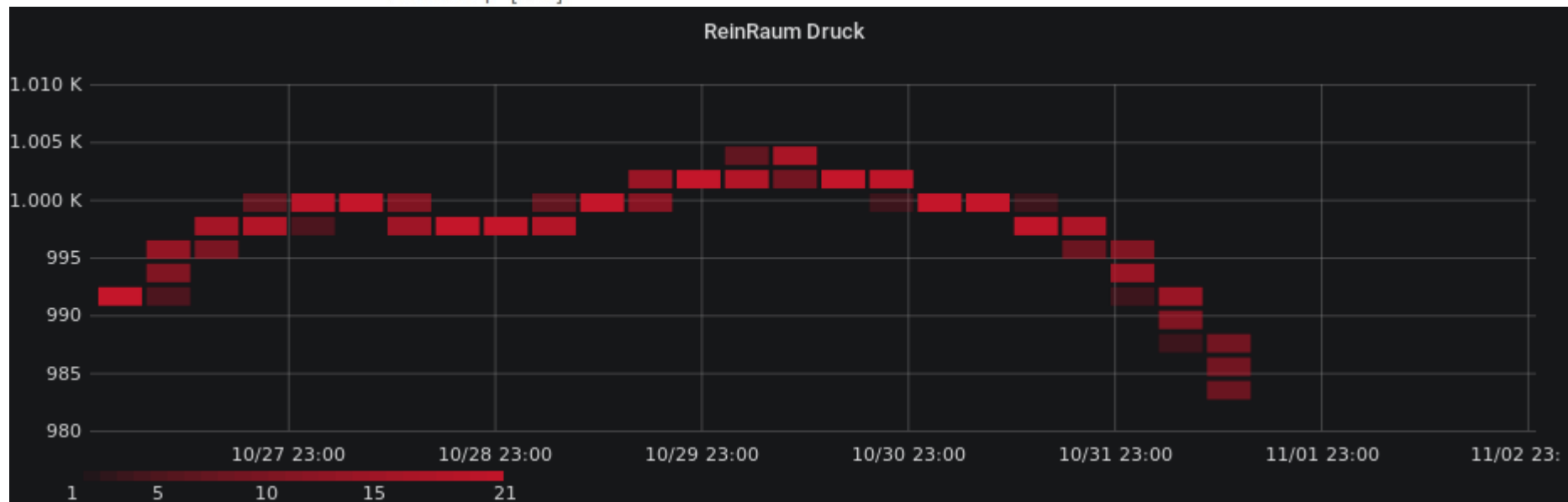
Tel.: +49(0)641-99-33224, 5. OG Raum 508

 [Jhonatan.Pereira-de-Lira@physik.uni-giessen.de](mailto:Jhonatan.Pereira-de-Lira@physik.uni-giessen.de)

# The reason to create an Alert



At 23:00 **Alert** was created and sent to Simon Bodenschatz: “Simon, the air pressure is low enough, we can get thousands of Muons, come and start GCS measurement”



<http://www.uni-giessen.de/fbz/fb07/fachgebiete/physik/institute/iipi/arbeitsgruppen/ag-dueren/aktuelles/DIRC2019/slides/slidesbodenschatz>

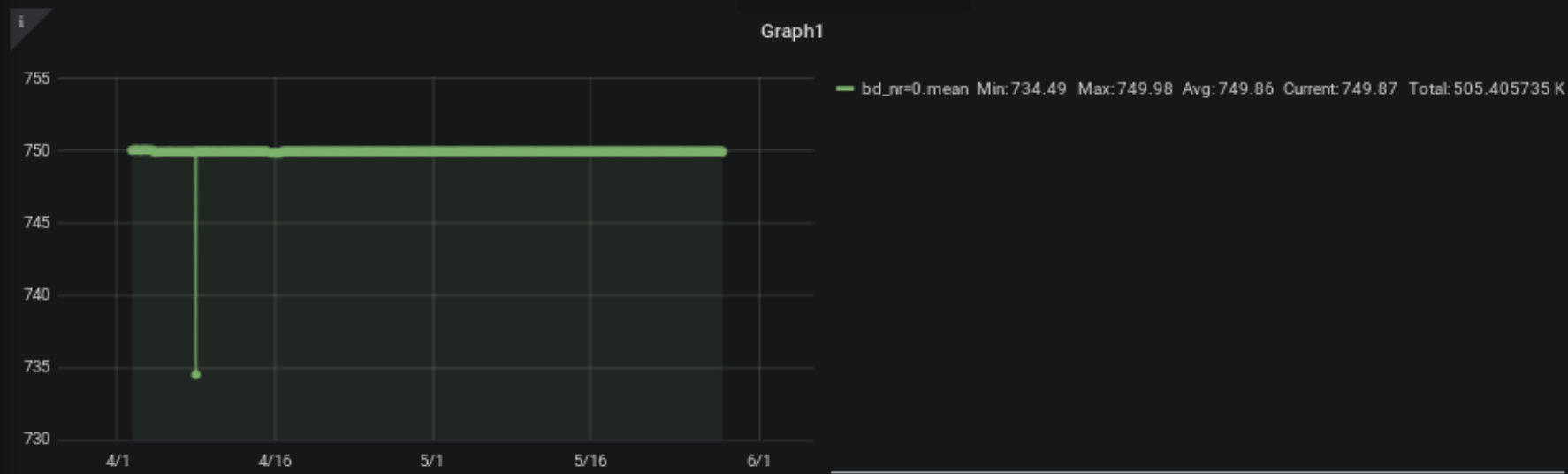
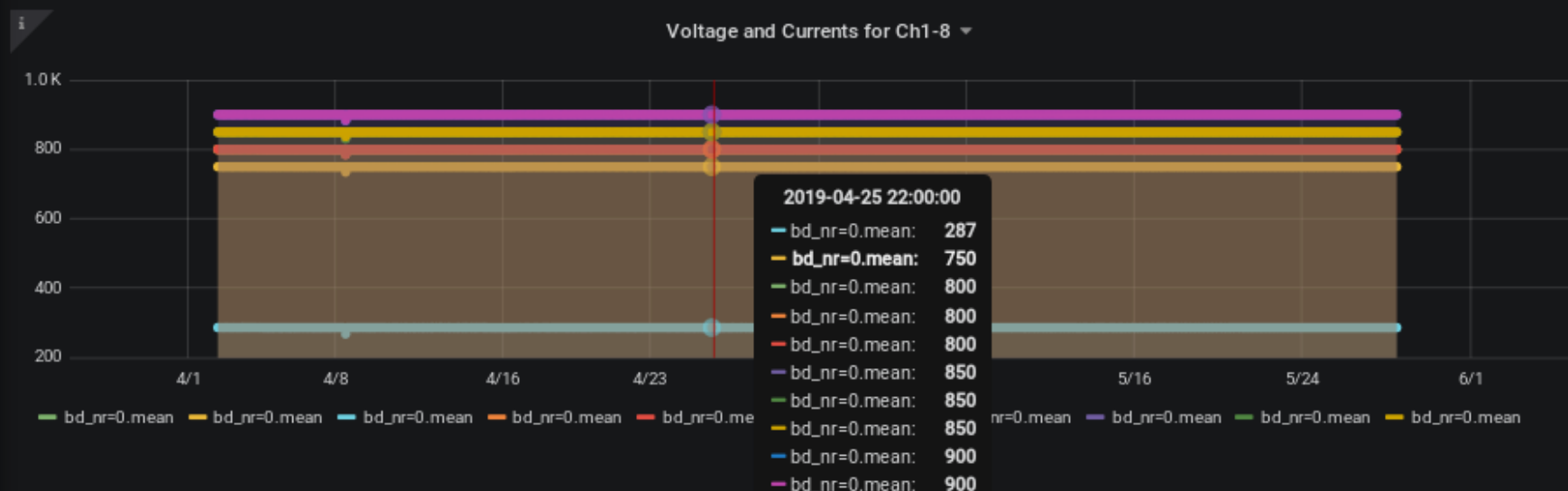
# Next steps

- Complete the DB parameters
- Include TofPET slow readings
- Define more slow parameters from DAQ
- Test RUN for a Month
- Read the “books” not only in Armenian but... also
- go,R,python,SQL....languages

# Backup...in case online does not work.GCS Monitoring Trigger HV and Current



AvetikDashboardsNr1 ▾



# GCS Monitoring Trigger HV and Current



# GCS Monitoring Reinraum

ReinRaum ▾

ReinRaum Pressure



ReinRaum Temperature and Humidity

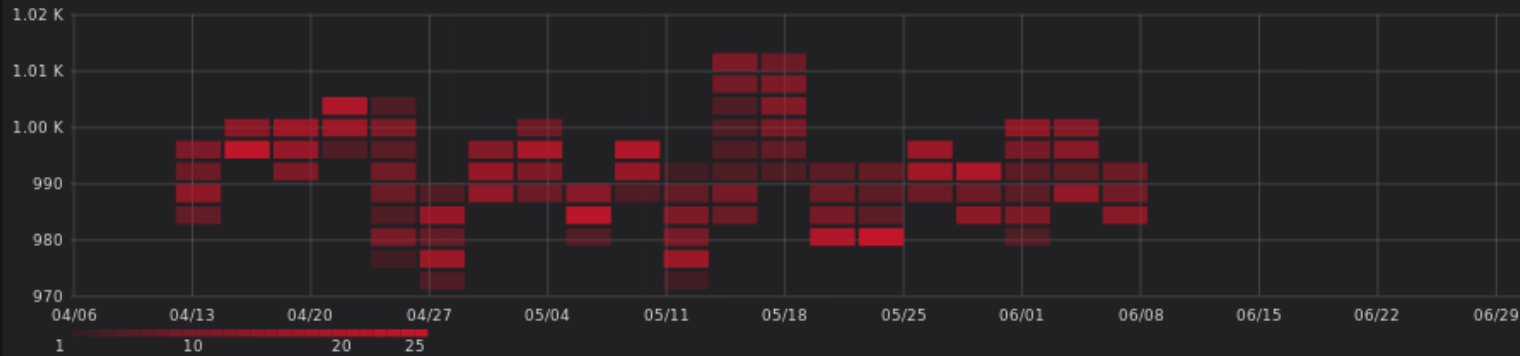




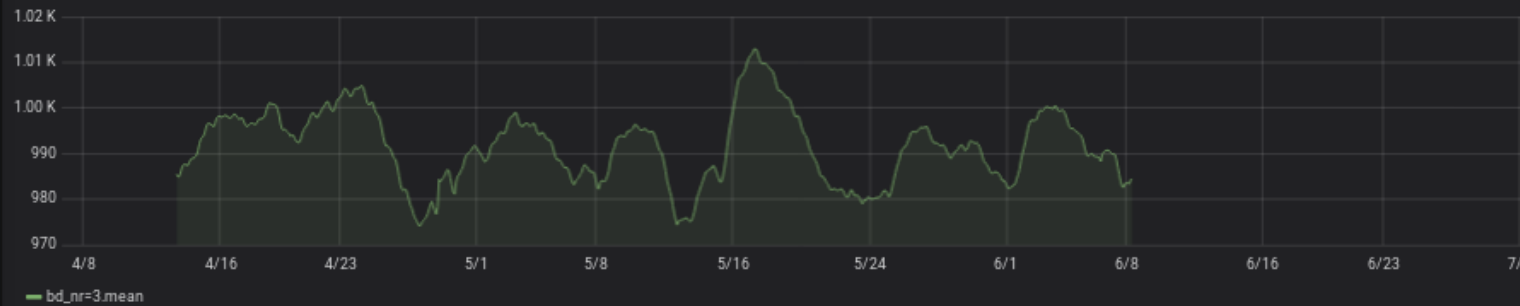
# GCS Monitoring Reinraum

ReinRaum ▾

Panel Title



ReinRaum Pressure



ReinRaum Temperature and Humidity

