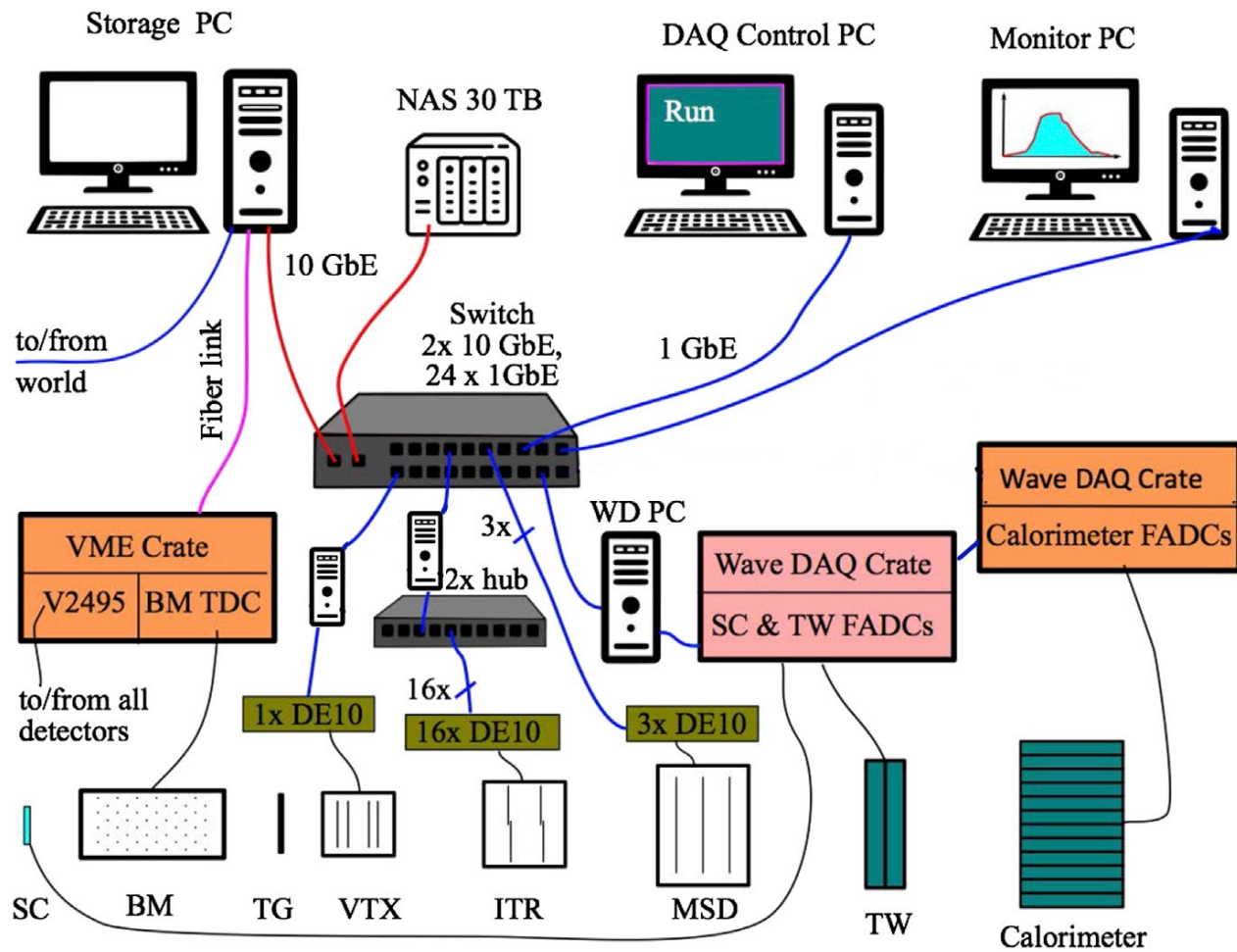


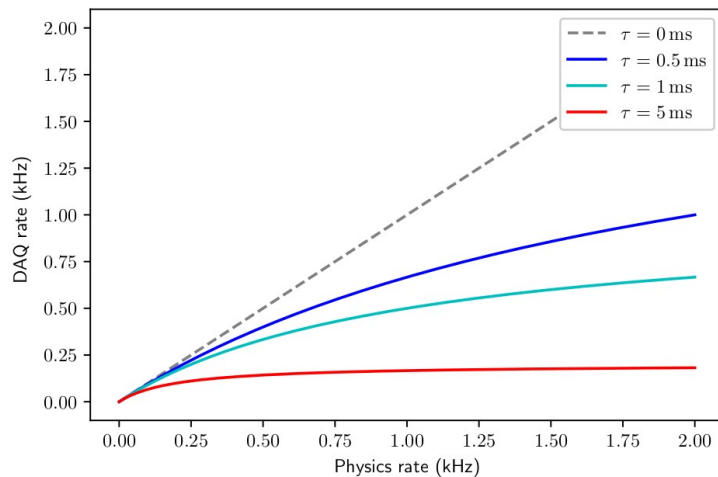
# DAQ developments for 2022 data takings

Riccardo Ridolfi, Sofia Colombi, Mauro Villa

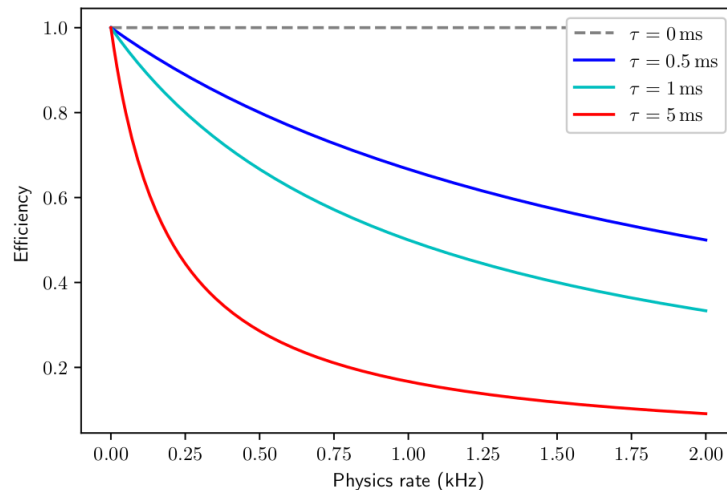
# TDAQ infrastructure



# DAQ performances



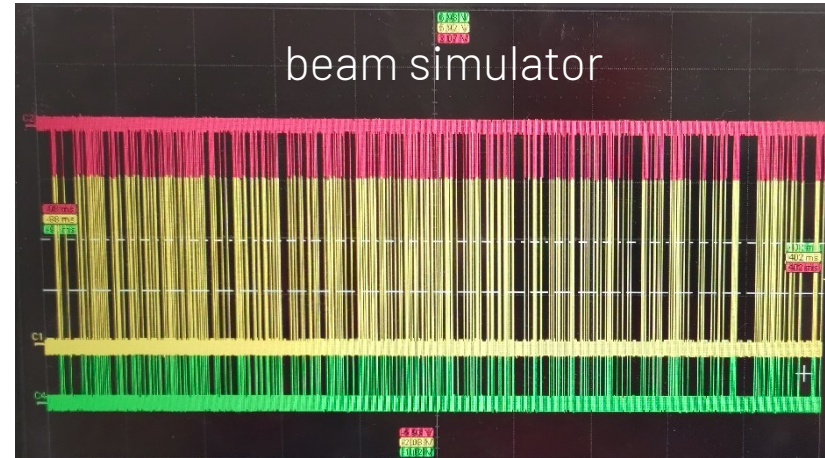
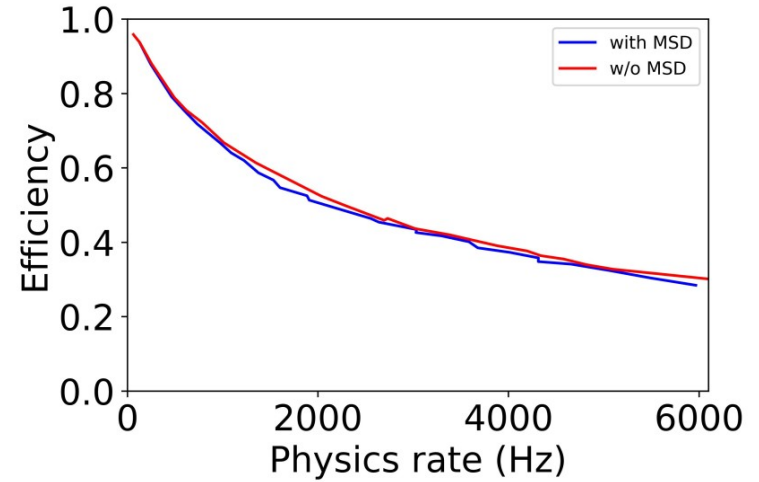
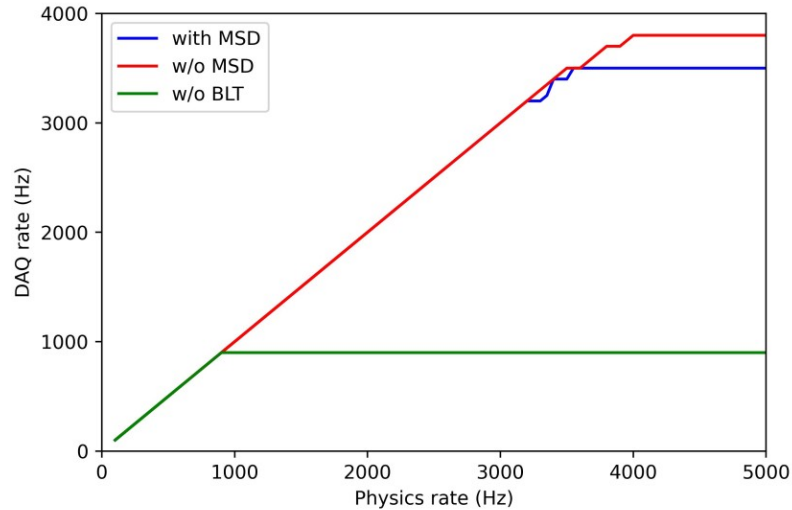
$$\nu = f(1 - \nu\tau) = f/(1 + f\tau)$$



$$\varepsilon = f/(1 + f\tau)$$

In modern experiments (e.g. FOOT) the event receiving is completely **decoupled** from data processing to absorb input rate fluctuations (this is why we have busy, timestamps etc.)

# DAQ performances



# TDAQ improvements

-new trigger configuration:  
fragmentation, MB, TOF/CALO  
alone, pedestal, neutron detectors  
triggers

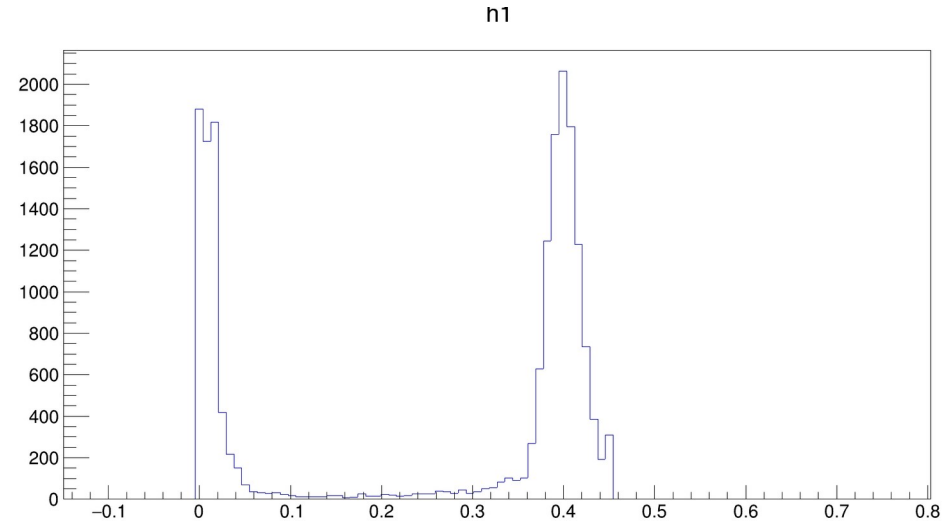
The screenshot displays the FOOT TDAQ SOFTWARE interface, titled "Partition FOOTVMEBridgePartition (on footbo1.tdaq.it)". The interface is divided into several sections:

- Run Control State:** Shows "NONE" and buttons for SHUTDOWN, INITIALIZE, UNCONFIG, CONFIG, STOP, START, HOLD TRG, and RESUME TRG.
- Run Information & Settings:** Displays "Run number 4357" and various configuration options including Max Events (150000), Run Type (Pedestal), Beam Type (NoWaveDream), Beam Energy (GeV) (Fragmentation), Tier0 Project Name (MargaritaMajority), File Name Tag (CALOalone), and Recording (NEUTRONalone). A "Set" button is visible.
- Run Control Panels:** A tree view showing the hierarchy of panels: NONE, RootController, Online Segment, Infrastructure, and ABSENT. The "RootController" panel is expanded, showing a list of sub-panels: CHIP, DDC, DF, DFConfig, DQM, Histogramming, ISRepository, MTS, Monitoring, PMG, RDB, RDB\_POOL\_1, RDB\_RW, and Resources.
- Subscription criteria:** A table with columns for TIME, SEVERITY, APPLICATION, NAME, and MESSAGE. The table shows a list of messages related to the initialization of the ROOT controller and the creation of various panels.

The bottom of the interface includes a "Clear" button, a "Message format" dropdown, a "Visible rows" slider set to 100, and a "Current ERS subscription" section with a "sev=ERROR or sev=WARNING or sev=FATAL" filter.

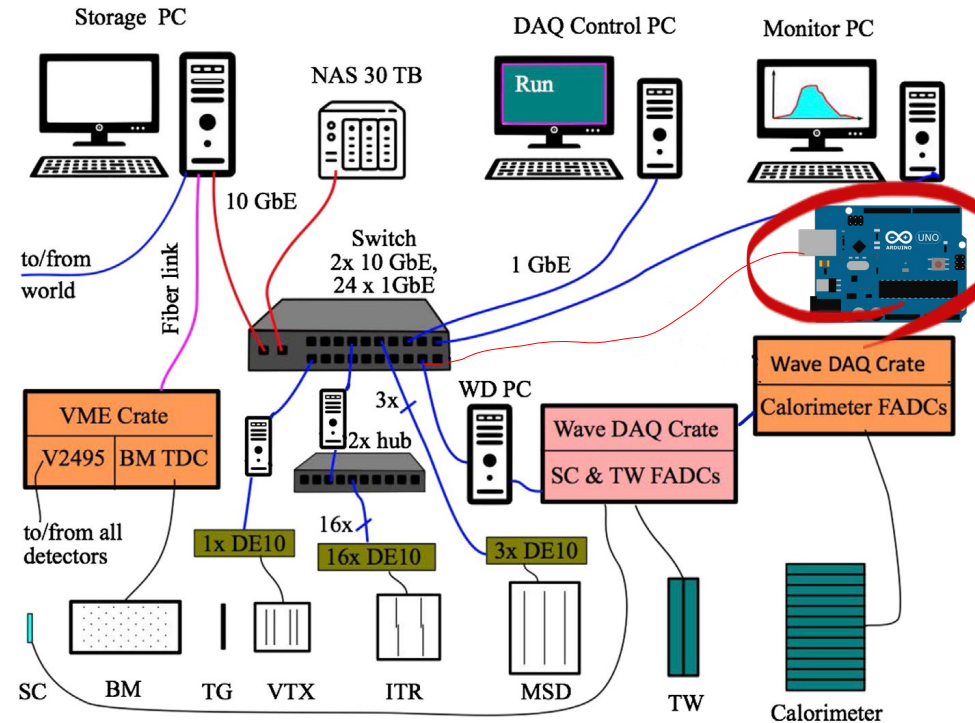
# Online Monitoring improvements

- fixed WD **trigger pattern** histogram;
- added **XML configuration** for online monitoring histograms (e.g. MSD charge), no need to recompile the whole DAQ
- added **trigger amplitudes** histograms for central bars (up to 12 channels) including XML calibration for each channel → **real-time evaluation of fragmentation trigger threshold**
- further histograms can be added (e.g. true beam rate provided by WD)



# Ongoing activity for HIT2022

- implementation of **calorimeter temperature reading** in the general TDAQ
- an **Arduino** reads all the temperatures via a custom system on VME
- Arduino will be connected on main switch to achieve the best integration with existing systems and with TDAQ



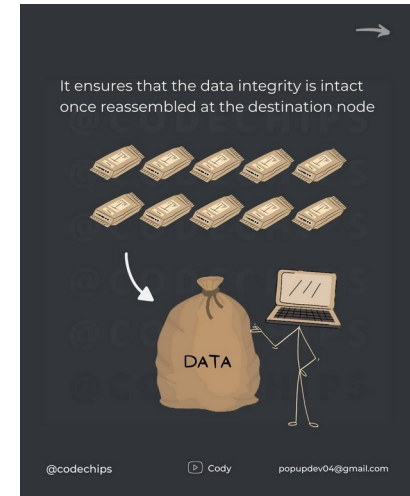
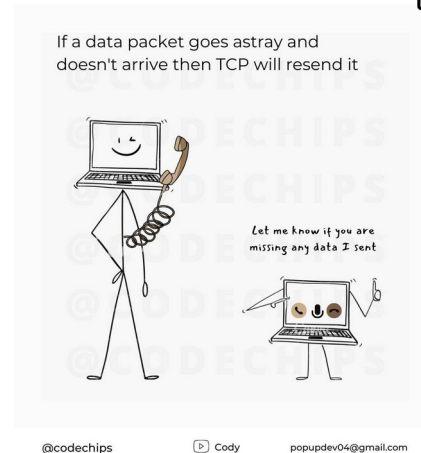
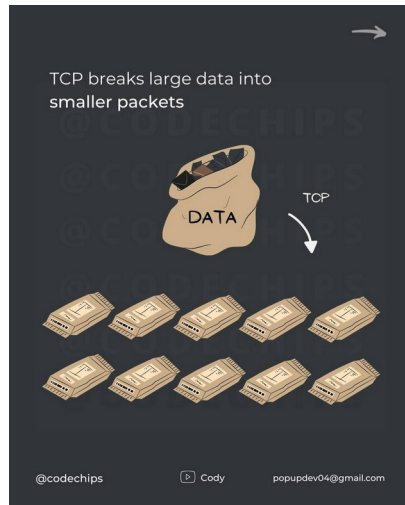
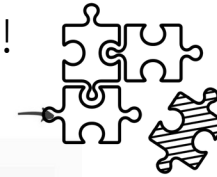


# Ongoing activity for HIT2022

To assure the correct data shipping in a “crowded” network TCP is needed also for Arduino (as well as for other systems)

Still deciding the readout frequency and the timing

In next weeks we will put all the pieces together!





# Conclusions

DAQ performances were investigated to find possible bottlenecks and room for improvements

Several new features will be available for next data taking

Implementation of temperature readout of calorimeter is actually ongoing



**Thanks for your attention!**