INTERNATIONAL INTERGOVERNMENTAL ORGANIZATION
JOINT INSTITUTE FOR NUCLEAR RESEARCH

Slow Control System for MPD TOF: Overview, Current Status, and Future Plans

VITALIY DRONIK
ON BEHALF OF THE MPD ~~VERY~~ SLOW CONTROL GROUP

What is slow control
and why is it important?

Time-Of-Flight (TOF) system of the Multi Purpose Detector (MPD) at NICA:

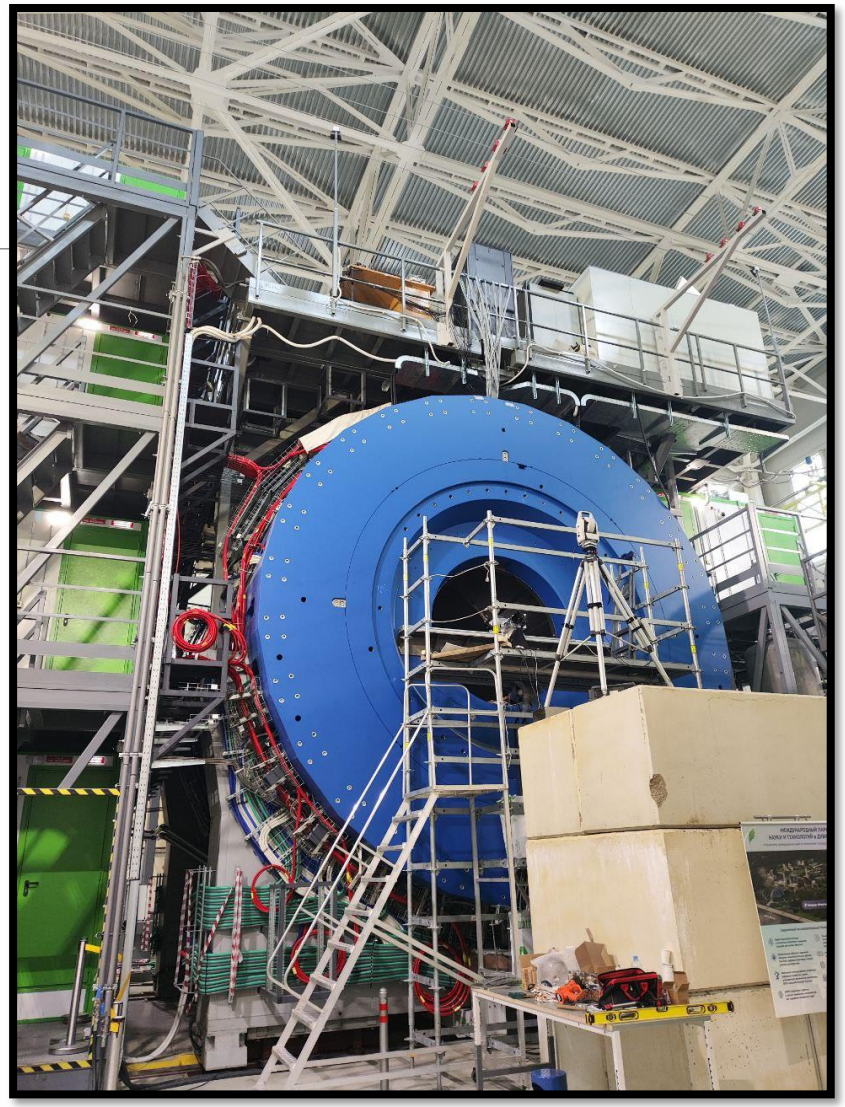
- One of many subsystems within the MPD
- Comprises 28 boxes, each containing 10 detectors
- Includes high voltage (HV), low voltage (LV), gas systems, electronics, and environmental monitoring
- Around 5k metrics to be monitored.

Summary: a significant amount of hardware that needs to be monitored.

Slow Control System (SCS):

- Consolidates data from various hardware into a single location for monitoring
- Provides user-friendly interfaces for easy interaction with equipment
- Archives data over extended periods
- Offers an interface to communicate with upper-level controls

Verdict: Absolutely crucial!

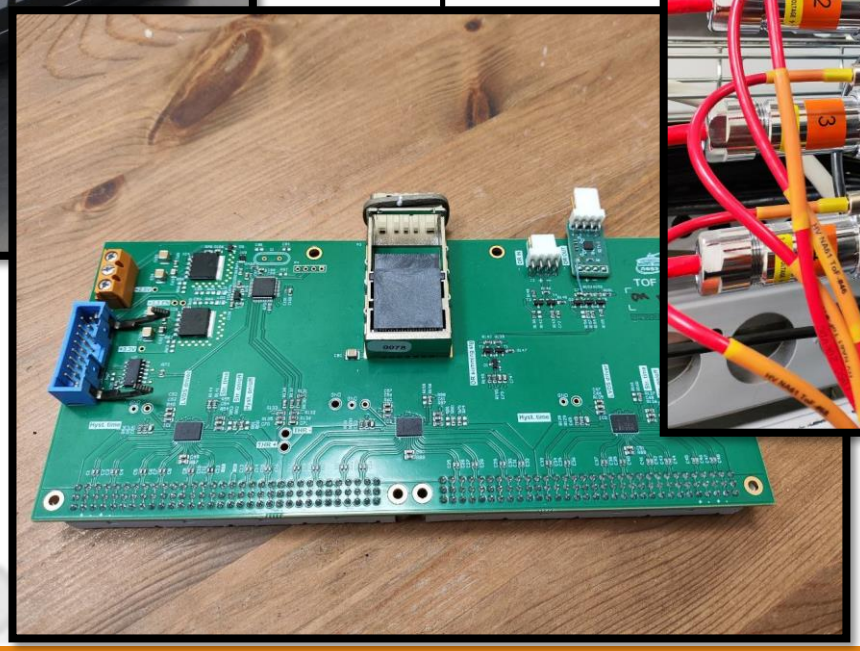


Hardware

Wiener MPOD

Gas controllers

Preamplifiers

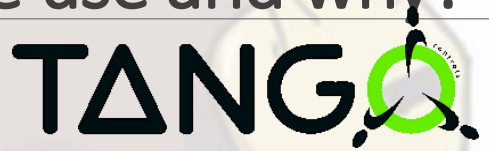


HV distributors

Software

What do we use and why?

Tango



- Open Source
- Scalable
- Flexible
- Well-maintained and supported

Grafana

- Open Source
- Integrates with various data sources (including PostgreSQL)
- Lots of plugins and extensions

PostgreSQL (TimescaleDB)

- Open source
- Performant and secure
- Optimized for time-series data

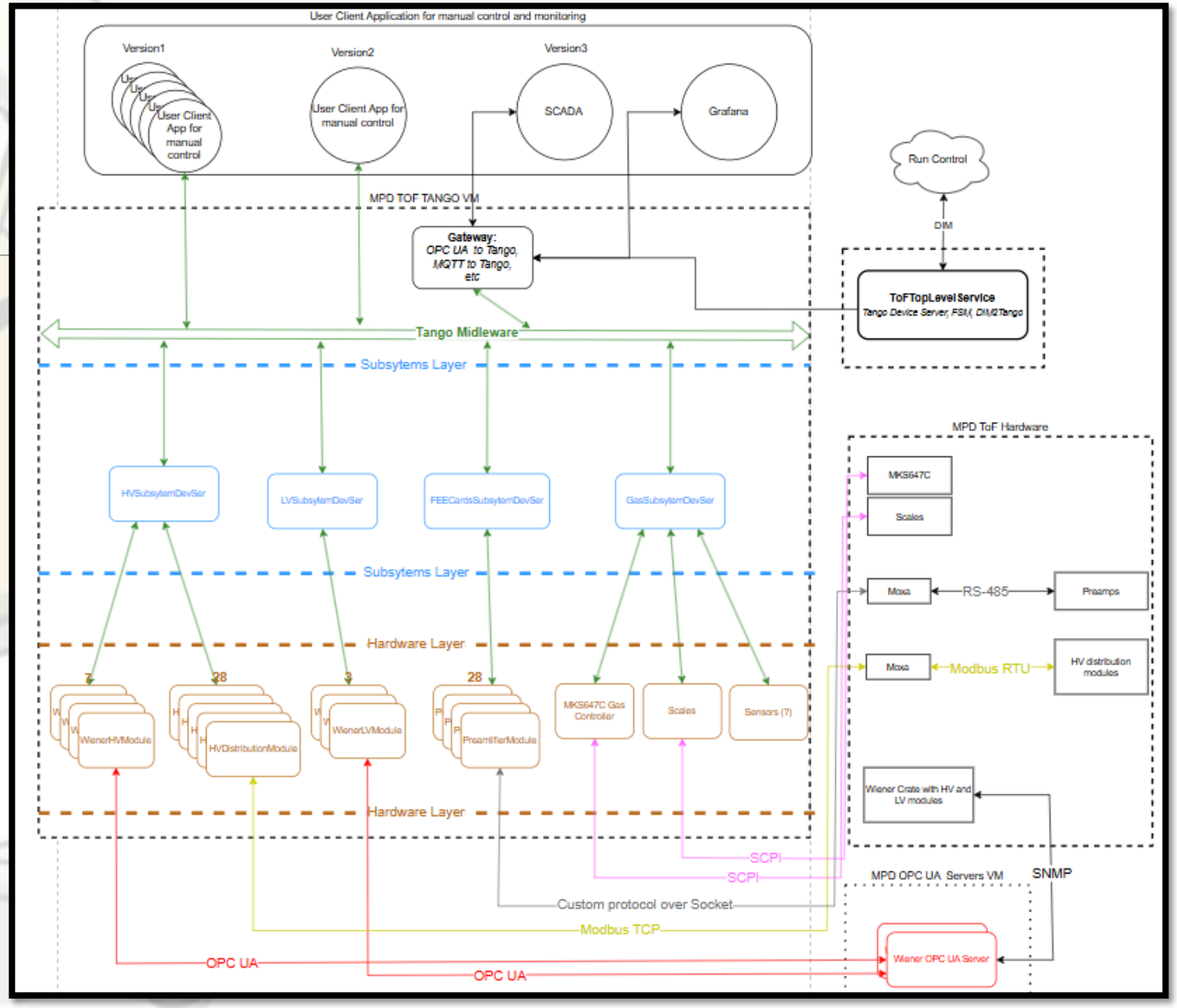
Python (pytango)

We love python!

TOF software layout

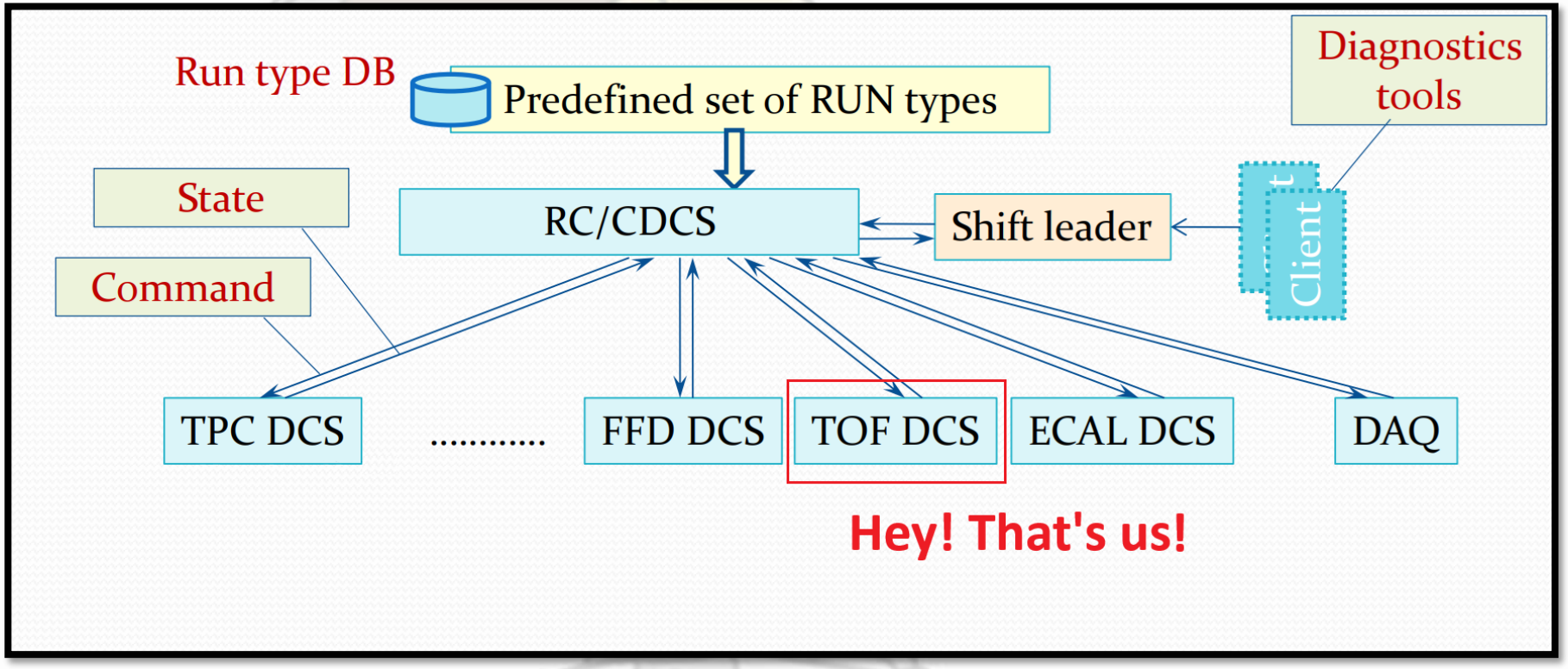
Layered structure

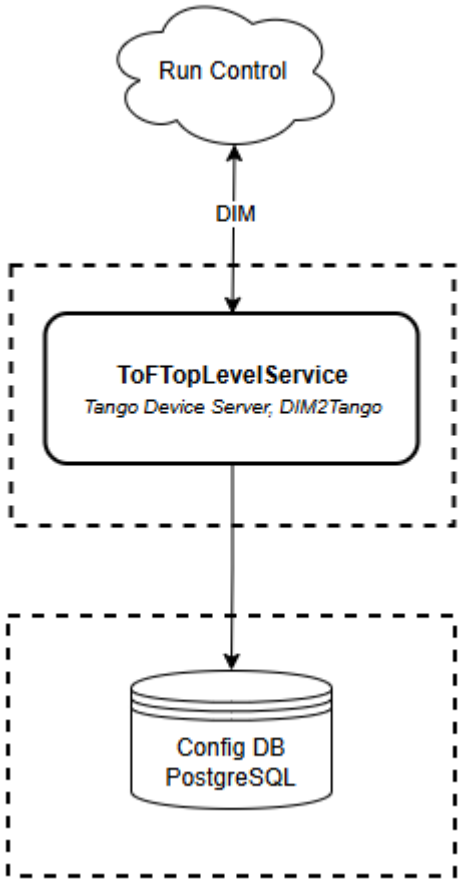
- The lower level communicates with hardware directly;
- The middle level organizes data by TOF subsystems;
- The top level provides interface for the Run Control software.



TOF SCS and MPD Run control

Communication with upper control levels

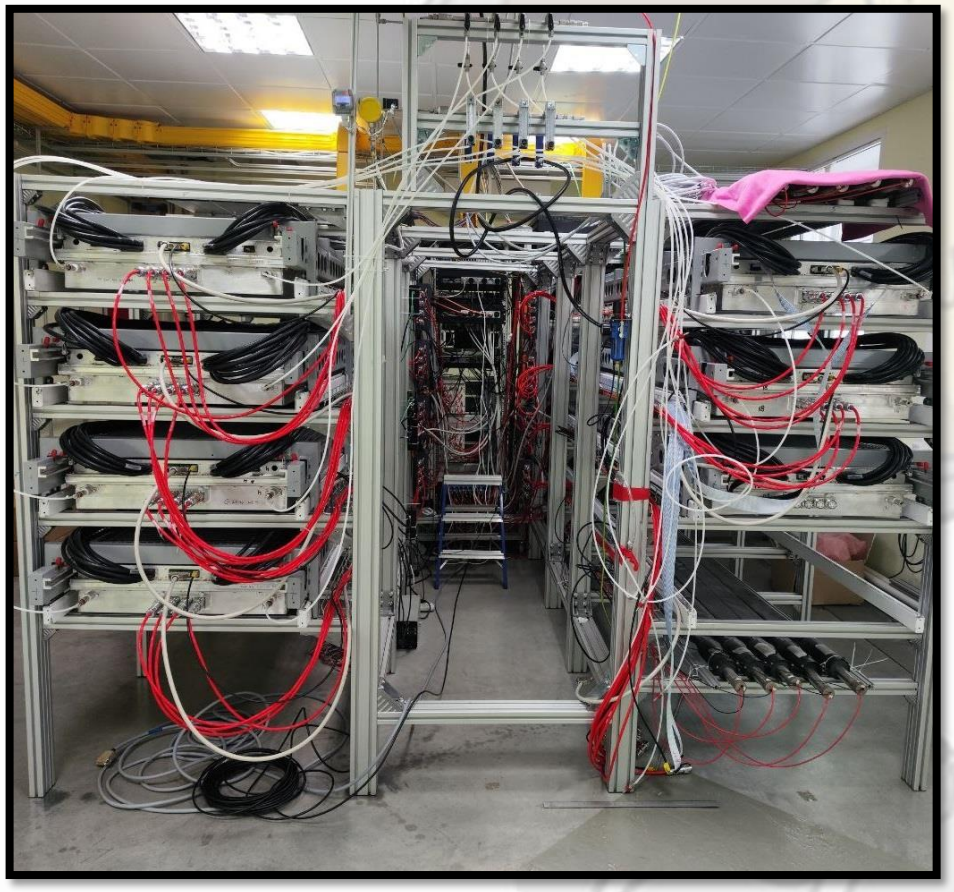




S. Sergeev. 15th Collaboration Meeting of the BM@N Experiment at NICA.

Test stand 42

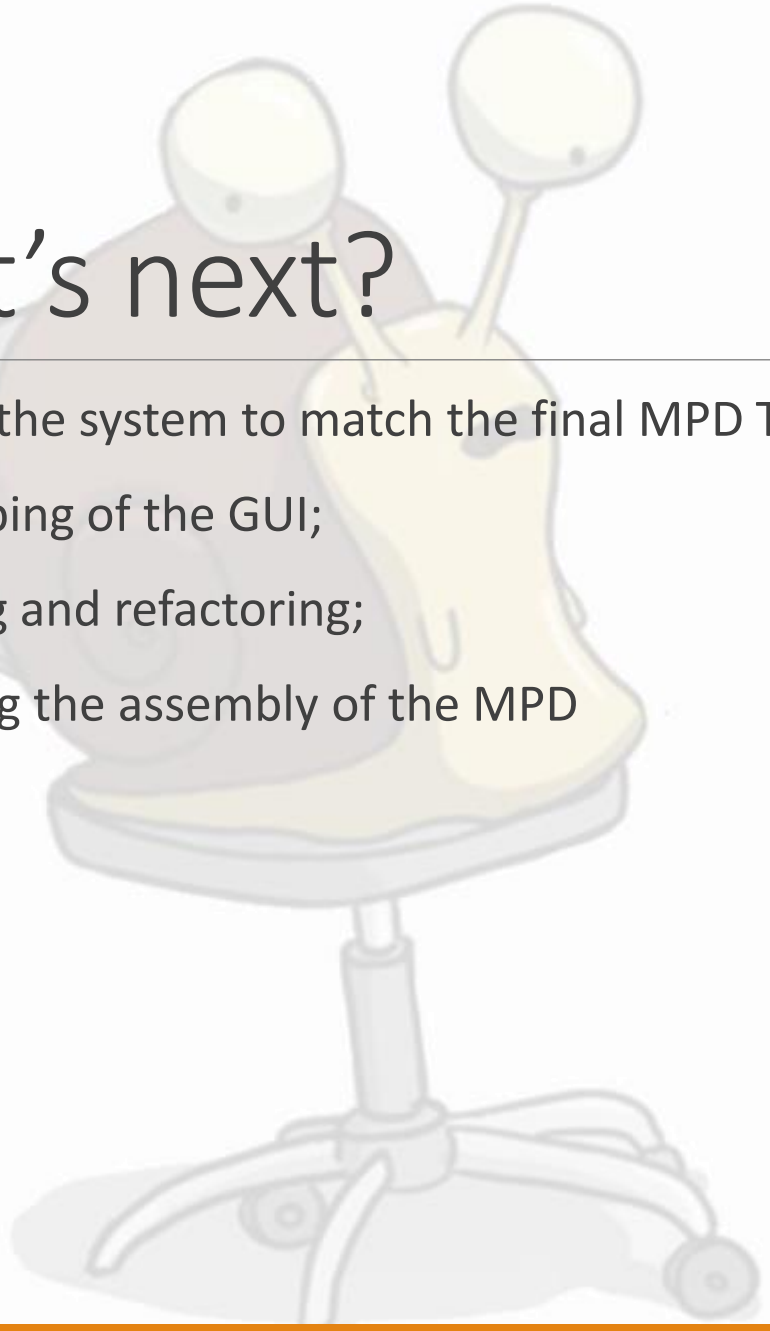
A sandbox to test our hardware and software



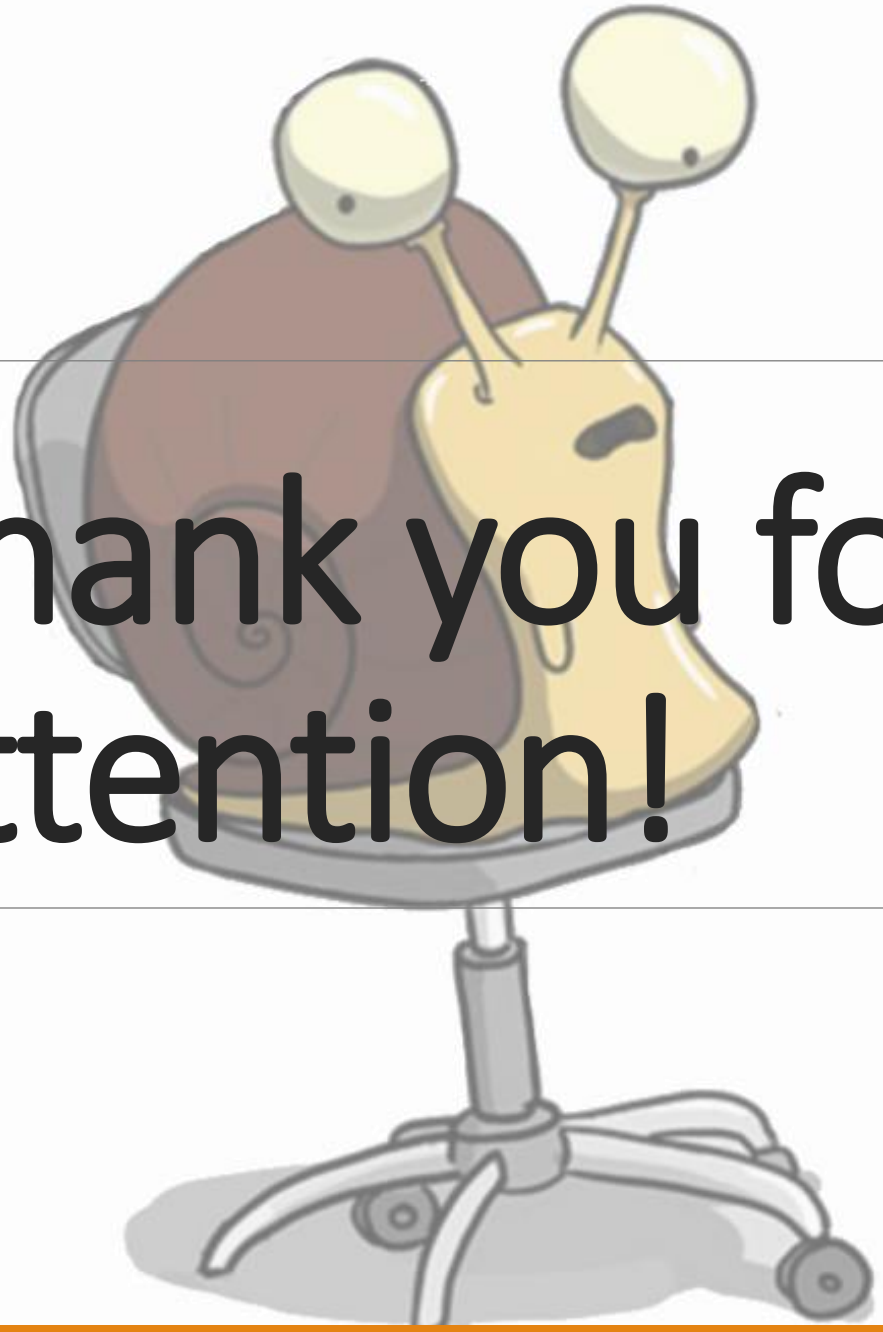
Visualization example: TOF gas system

Visualization example: single detector

What’s next?



1. Scaling the system to match the final MPD TOF configuration;
2. Developing of the GUI;
3. Refining and refactoring;
4. Awaiting the assembly of the MPD



Thank you for your attention!