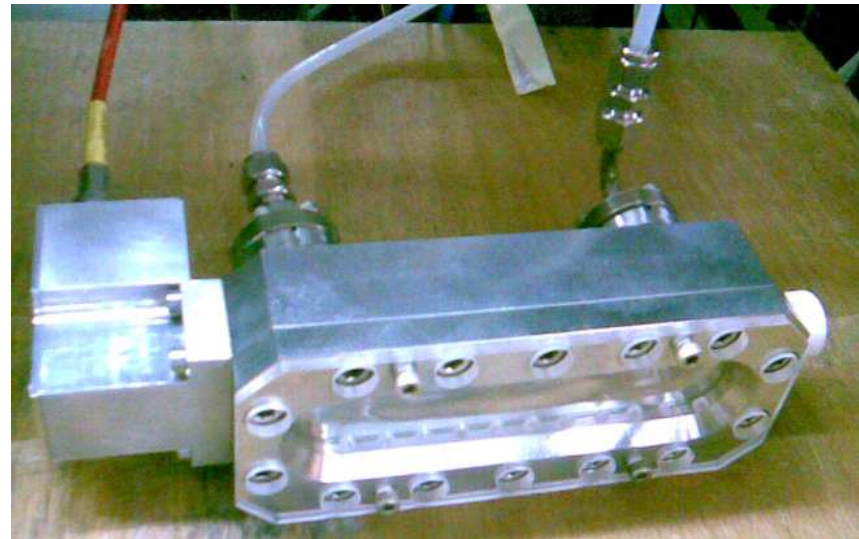


# SWPC for monitoring, stability and aging tests

Patrik Thuiner

# SWPC for monitoring, stability and aging tests

- High cleanness SWPC (new detector available from PH-DT-DI in few months)
- Control, monitoring and DAQ software already available or implementable

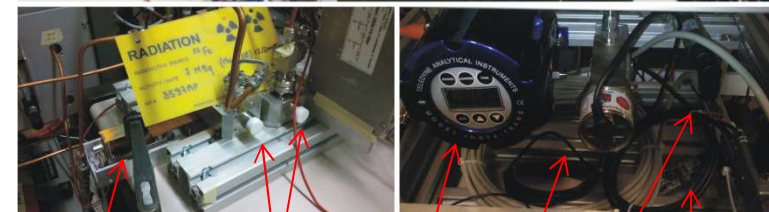
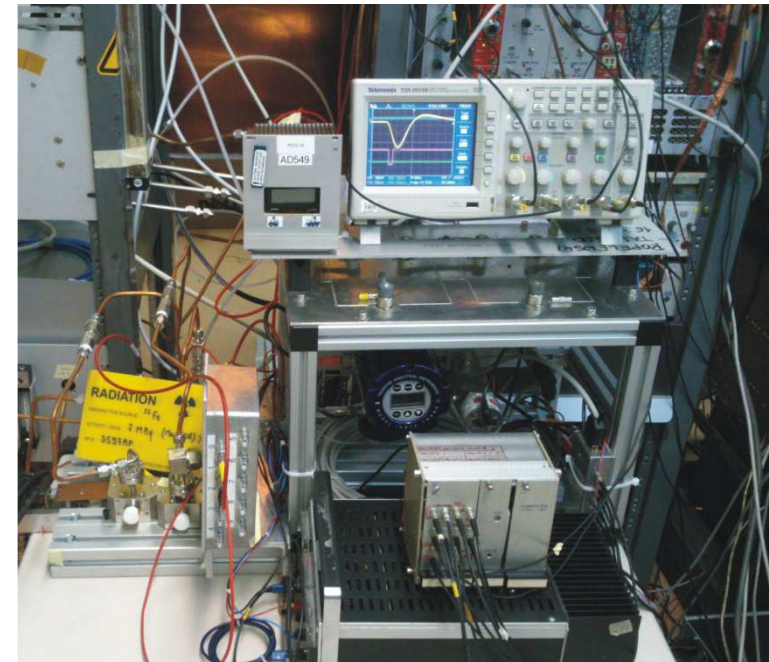


# SWPC for monitoring, stability and aging tests

- Current
- Count rate
- Spectrum
  - peak positions (Gaussian fit)
- In-line measurement of parameters
  - Pressure
  - Temperature (ongoing)
  - Humidity
  - Oxygen content
- Environmental parameters
  - Pressure
  - Temperature
  - Humidity

# Current setup

- 2 SWPC
- Gas mixtures Ar/CO<sub>2</sub> 70/30 and Ar/CO<sub>2</sub>/CF<sub>4</sub> 45/15/40
- Sensors for measurement of environmental parameters and parameters inside gas line
  - TELEDYNE ANALYTICAL INSTRUMENTS Trace and Percent Oxygen Transmitter
  - SensorTechnics CTE9000 pressure transmitter
  - Xentaur LPDT hygrometer
- Shutter with collimator for baseline subtraction of currents (required due to high sensibility to environmental parameters)
- Automated control and measurement with NI LabVIEW™ allows long-term studies
  - C.A.E.N. V1718 USB-VME Bridge
  - NI USB-6009 DAQ USB Device
- Online and offline data analysis with NI LabVIEW™
- Adaptable to other gas detectors



Shutter with Fe-55 sources (not shown)

2 SWPC

In-line oxygen sensor

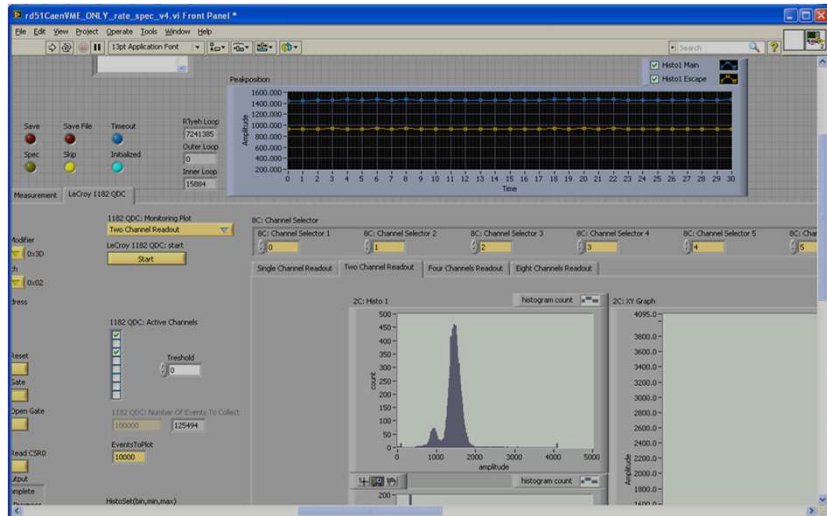
In-line Pressure sensor

In-line humidity sensor

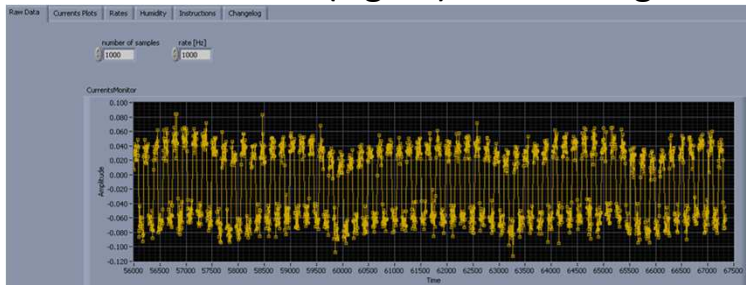
Temperature and humidity sensor

# LabVIEW™-based Control and DAQ Software

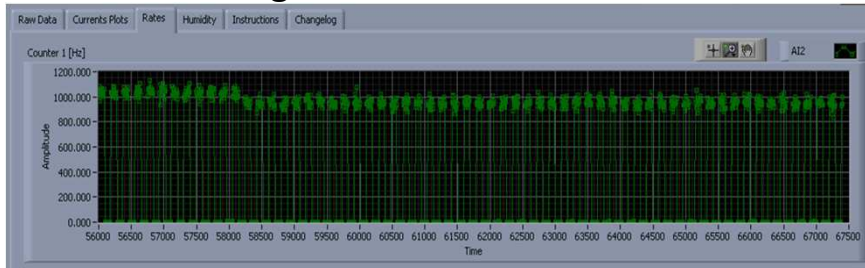
## Spectrum Acquisition and on-line peak position monitoring



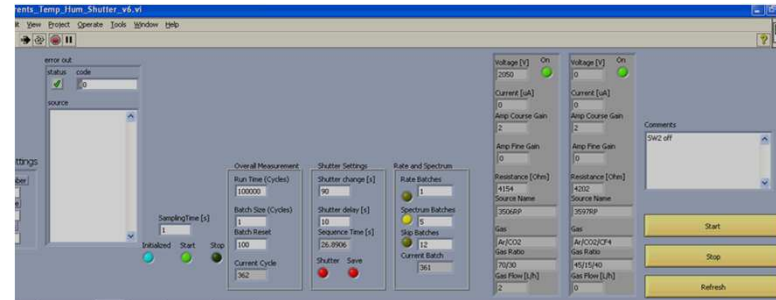
## SWPC HV Current (signal) Monitoring



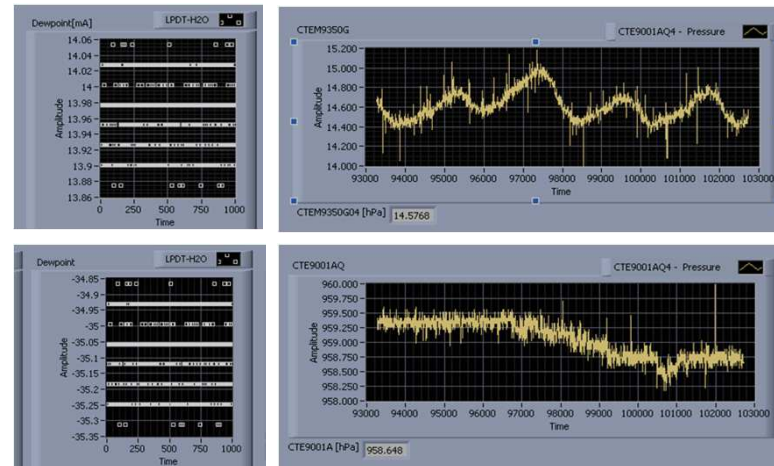
## Rate Monitoring



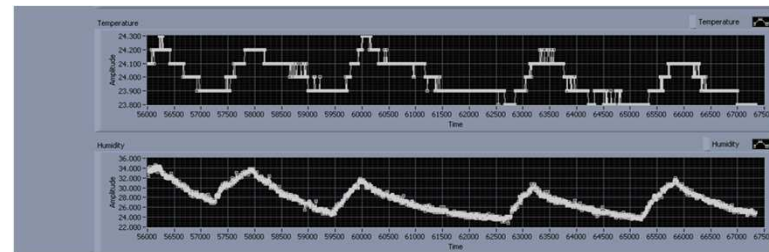
## Scan/DAQ Control



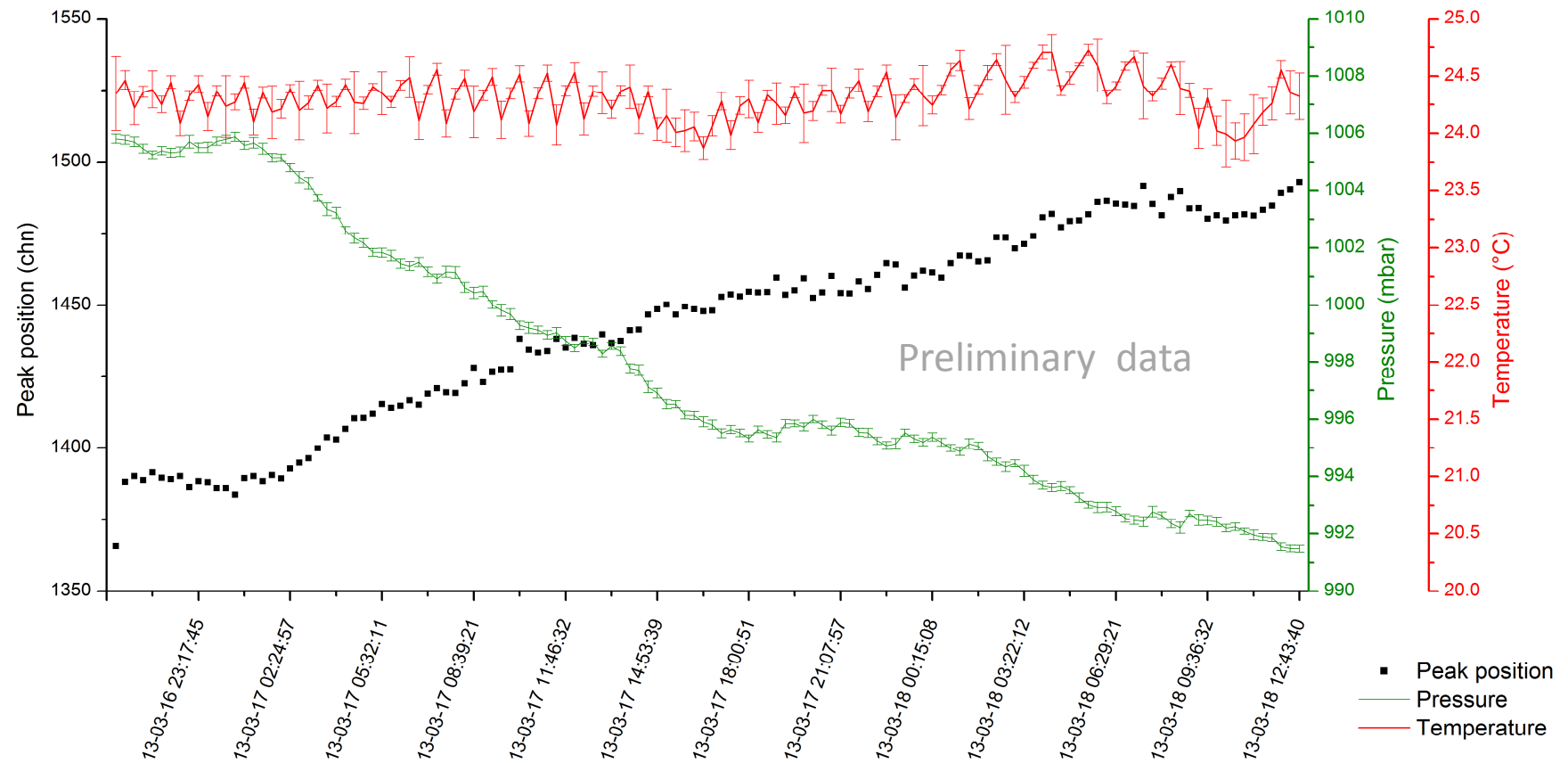
## Gas Line Monitoring: Pressure (Ambient and Detector), Humidity and Oxygen Content



## Ambient Temperature and Humidity Monitoring



# Gain calibration and stability measurements



Peak position of Fe-55 peak @5.9 keV due to change of environmental parameters  
Ar/CO<sub>2</sub> 70/30 at 2050 V and 1000 Hz  
Mean values of temperature and pressure during spectrum acquisitions over 15 min

# Proposed applications of system

- Monitoring of gas quality in LHCb gas system  
(Roberto Guida, Beatrice Mannelli)
- Stability of GEM foils for ALICE  
(Vladimir Peskov)
- Ageing Measurements for CMS  
(Jeremie Merlin)

Thank you for your attention!