# Working Group #2
# Next-generation cavity infrastructures

Conveners:
D. Bloess (CERN), J. Mammosser (JLab) D. Reschke (DESY)

Goal: Identify site independent system issues with existing processing facilities

Topics included: Cleanroom Technology, HPR Systems and BCP and EP Processing

# Cleanroom Technology to manufacture under „super“clean conditions

v. Kahlden, CCI company

Discussion covered

- **Many options on design and materials**
- **Instrumentation and concepts for quality control**
- **Cleanroom Applications**

Highlights

- ✓ Design process equipment for clean environment
- ✓ Design cleanroom around the process
- ✓ Education of personnel is very important
- ✓ Customers usually do not know what they need

## Cleanroom technology – how to explain?

**The term**

**„Cleanroom Technology“**

**includes *all Technologies***

**which are necessary to manufacture the**

**product according to the specification**

## Specification of Contamination

# „Contamination has to be specified:

| | |
|---|---|
| ❑ Cleanliness class | Air – Surface (ISO – 14644-1) |
| ❑ Temperature – Humidity | Air |
| ❑ Noise Level | Room |
| ❑ Vibration | Equipment - Building |
| ❑ Molecular Contamination | Air (AMC) – Surface (SMC) (14644-8) |
| ❑ Electrostatic Charge | Surface |
| ❑ Magnetic field | Air |

# EP/BCP at Jlab

Discussion covered:

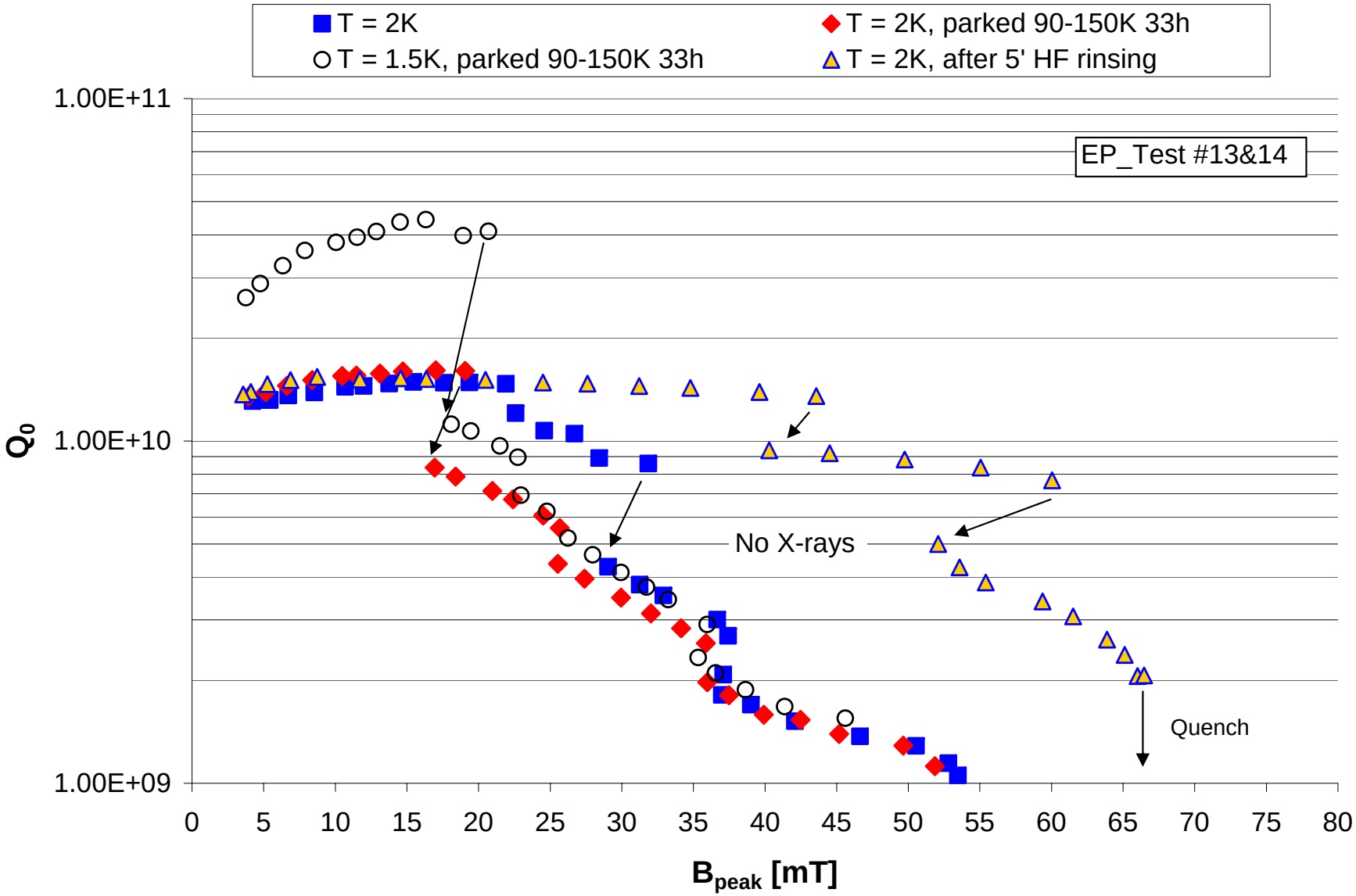
- Single cell processing has started at Jlab to understand EP

Highlights

  - Seen effects of HF loss while processing single cells
  - IV curves did not indicate problem
  - Fresh acid recovered good performance

# P4-HAF/P5-HAF 175μm EP at 19V, 1x1h HPR

## $Q_0$ vs. $B_{apeak}$



Experience with EP at DESY
N. Steinhau

Discussion covered

- What has been learned on system operation

Highlights

- Level sensor and flow meter not compatible with acids

- Temperature control not adequate
- HF absorption or leaks in heat exchanger
- Acid leaking thru heat exchanger tubing

# HEAT EXCHANGER

VERSION I

VERSION II

# EP System Improvements and studies

Fabien Eozenou
DAPNIA/SACM/LESAR

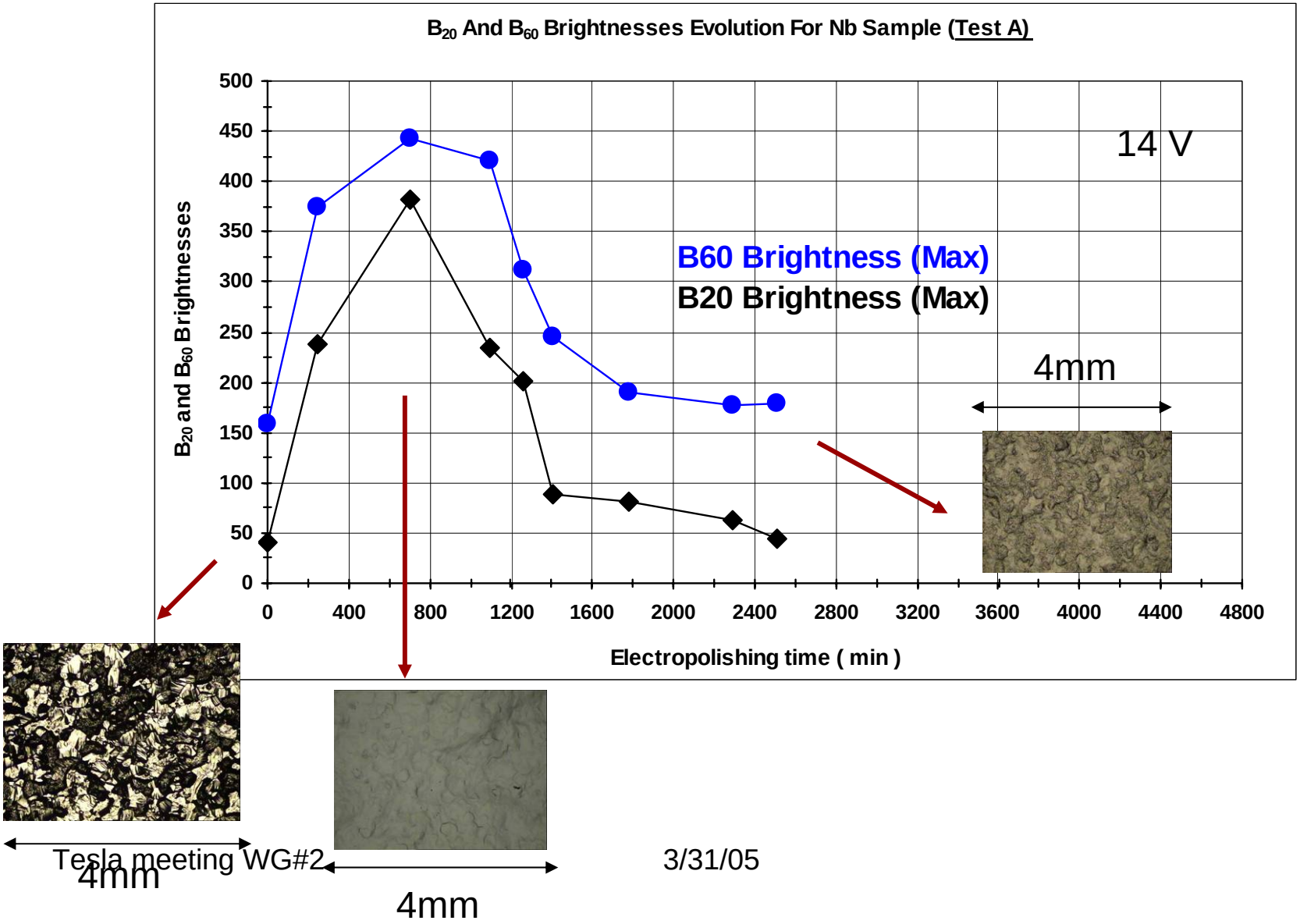
## Discussion Covered

- Improvements to EP system design aspects
  - Piping, data acquisition, cathode design ect.
- Current studies on small samples

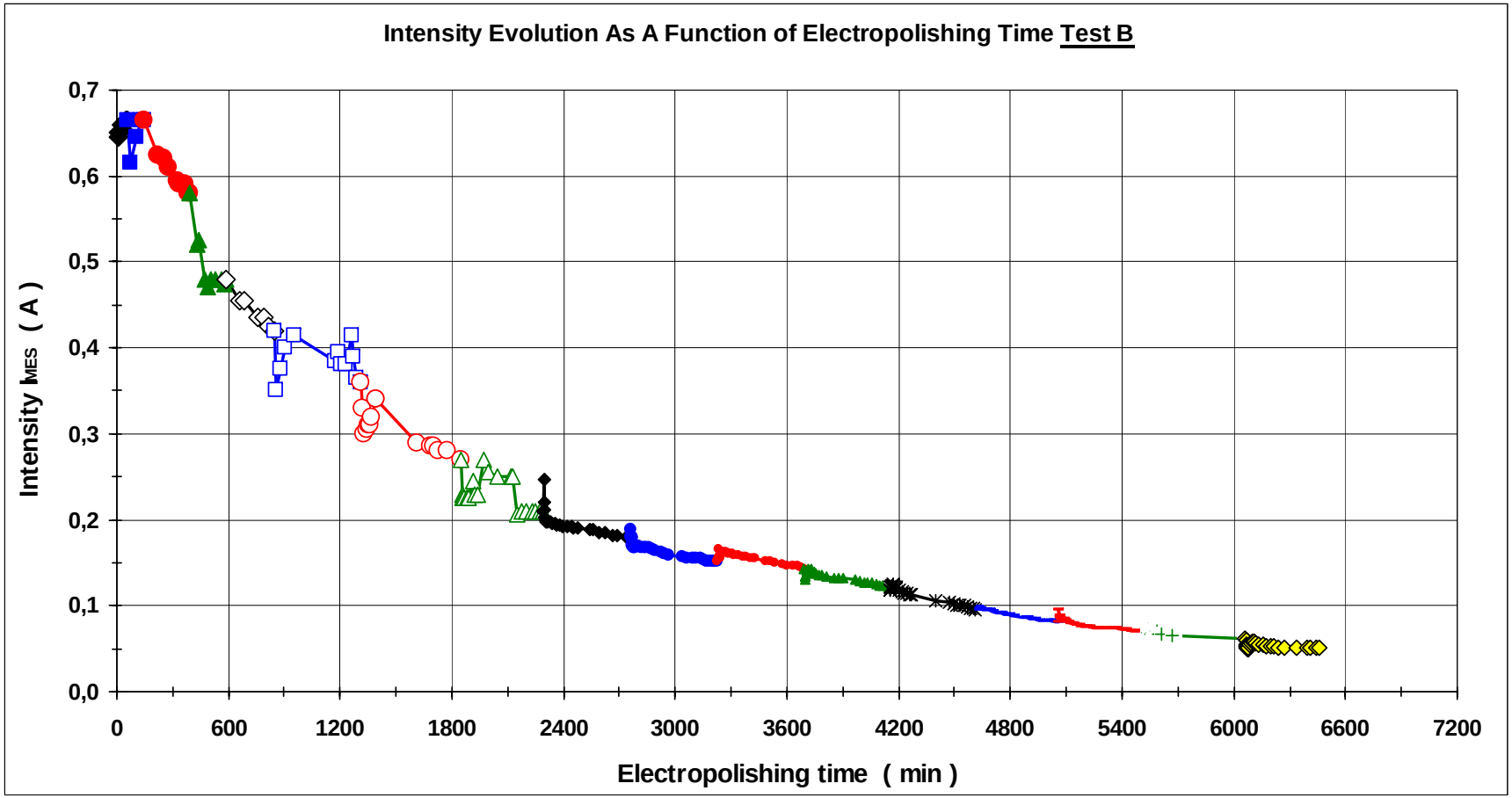
## Highlights

- New method using brightness detection to understand aging of acid along with Nb surface quality
- And aging effects on polishing speed

# Aging effect on samples' surface.



# Aging Effect On Polishing Speed.



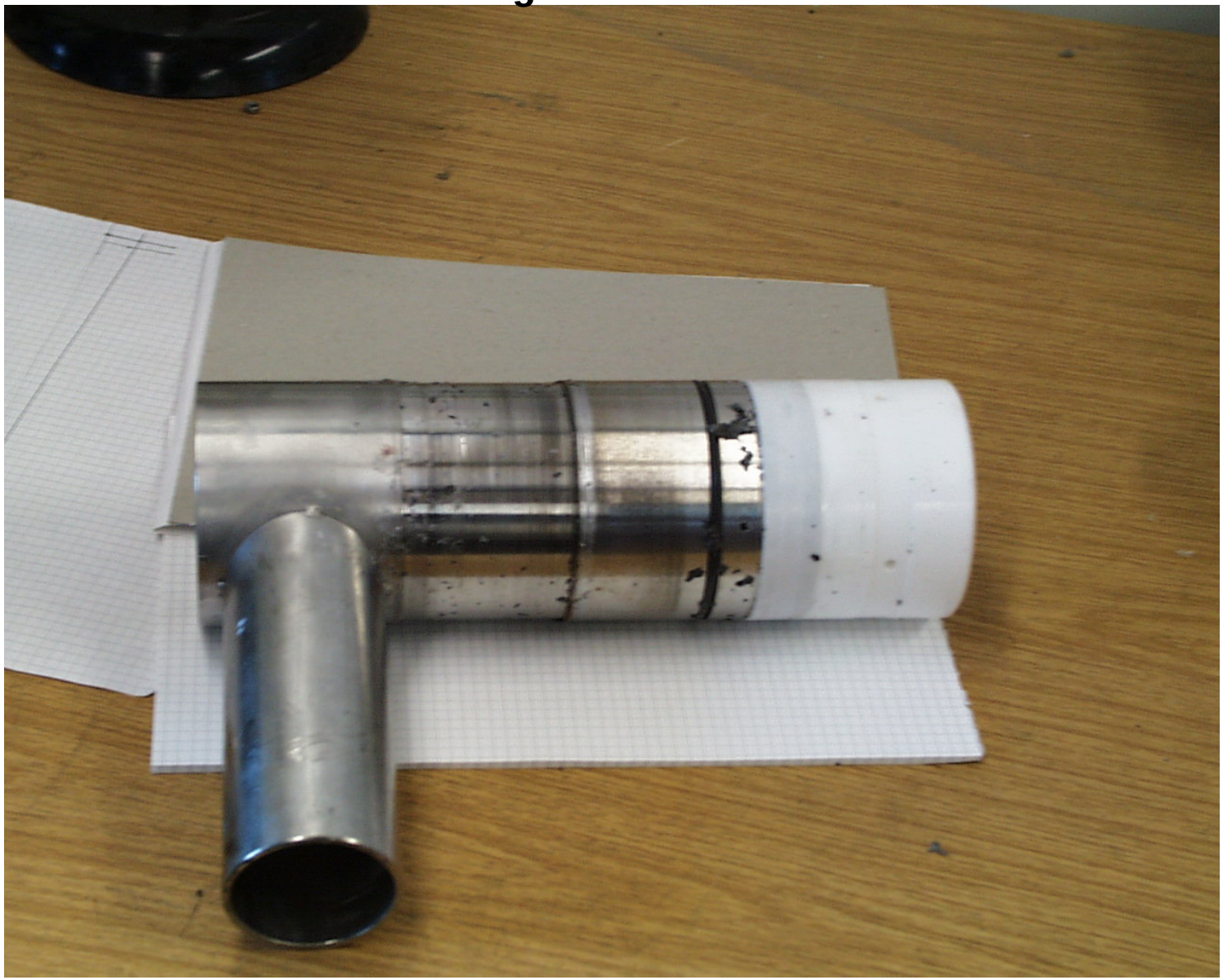
# HPR Experience at DESY
# A. Matheisen

Discussion covered:

- History and experience with existing system design

- Highlights
  - New designs need better access
  - Wand is contaminated by rotational friction on local components
  - Filter needs to be after HP valves
  - Material incompatibility with many subcomponents
  - Should continue with improvements or a new system be built?

# Main design draw back



# HPR Experience at CERN

D. Bloess

Discussion covered:

- Experience with HP rinsing of LEP cavities

Highlights

- Tests on samples pointed to importance of;
- Nozzles of sapphire producing laminar flow to surfaces

- Online monitoring of resistivity of particles and TOC

- Rinsing takes a very long time on contaminated LEP cavitie
  - → understanding of longer rinsing needed

# HPR Experience at JLab

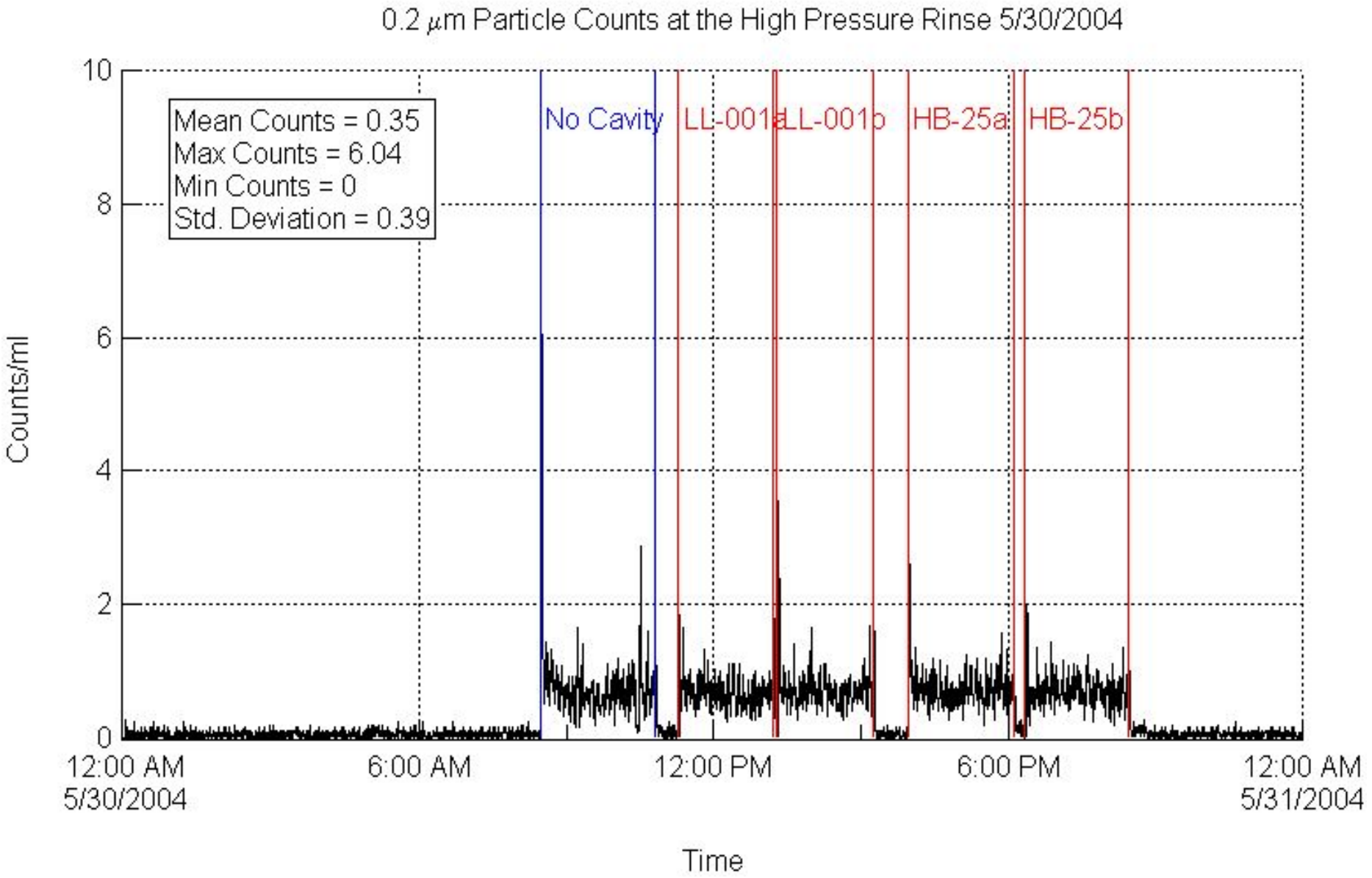
J. Mammosser

Discussion covered:

- Production experience with HPR failures and QA instrumentation experience

Highlights

- It took a long time to understand instruments used for QA
- Not enough rinsing on cavities
- More effort is needed to understand the HPR effectiveness


0.2 μm Particle Counts at the High Pressure Rinse 5/30/2004
Mean Counts = 0.35
Max Counts = 6.04
Min Counts = 0
Std. Deviation = 0.39
No Cavity
LL-001a
LL-001b
HB-25a
HB-25b
Counts/ml
10
8
6
4
2
0
12:00 AM
5/30/2004
6:00 AM
12:00 PM
6:00 PM
12:00 AM
5/31/2004
Time

Conclusions:

**Cleanrooms** – are advanced in design and a lot of options are available

What's needed is:

- "Clean" design of cavity process tooling
- Development of specifications

**HPR systems –** a lot of experience exists and one could build the next generation design

What's needed is:

• Understanding of effectiveness and optimization for cavity of choice (pressure measurements INFN)

•Instrumentation for measuring particles in drain

Conclusions:

**BCP Systems** – Not much discussed, and again a lot of experience with a good comfort level

**EP Systems** – Some problems to tackle but advanced (DESY)

What's needed is:

- Quick analytical method for bath composition