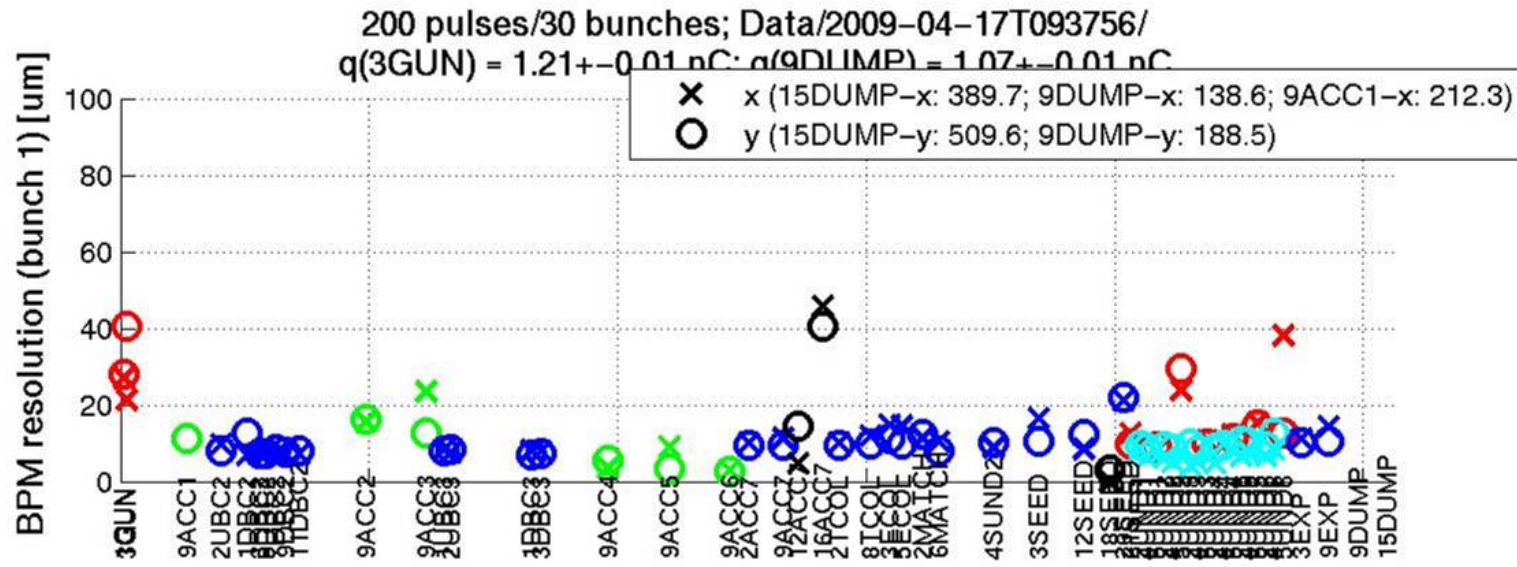


Status of FLASH-BPMs

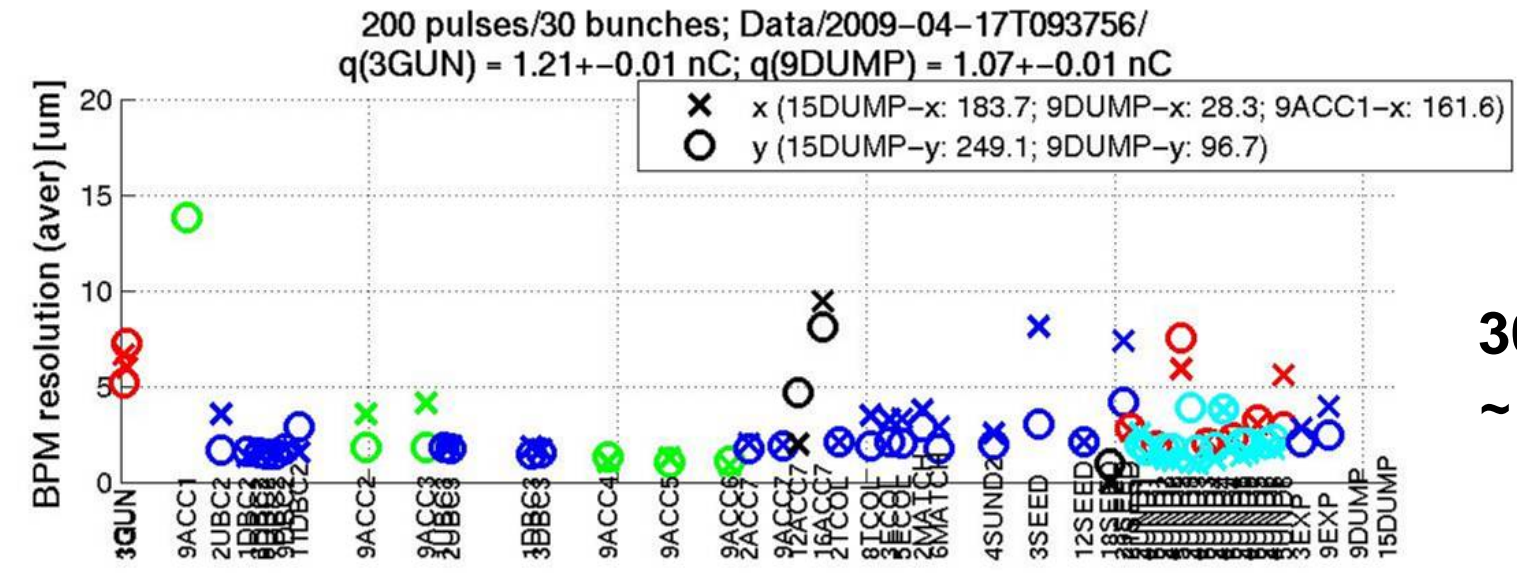
Nicoleta Baboi

- **Status of BPM-system**
- **Maintenance work**
 - checked/adjusted trigger delay, zero-offset, calibration
 - 6BYP: used by energy server
- **BPM studies**
 - HERA (Neumann) electronics in μ TCA tested
 - toroid in μ TCA tested
 - BPM resolution for multibunch
 - toroid resolution vs. charge
- **FLASH Upgrade**
 - Changes in the BPM system

BPM Resolution - Multibunch - FEL Mode



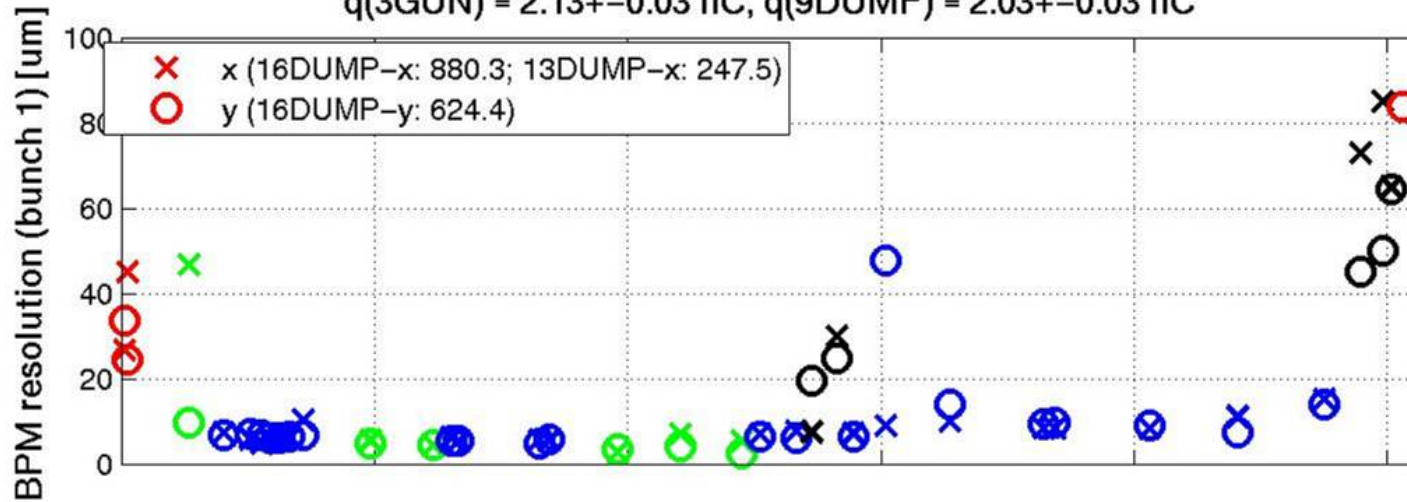
stripline
 button
 button
 (inside UND)
 cavity
 and re-entrant cav.
 other
 (e.g. XFEL-test)



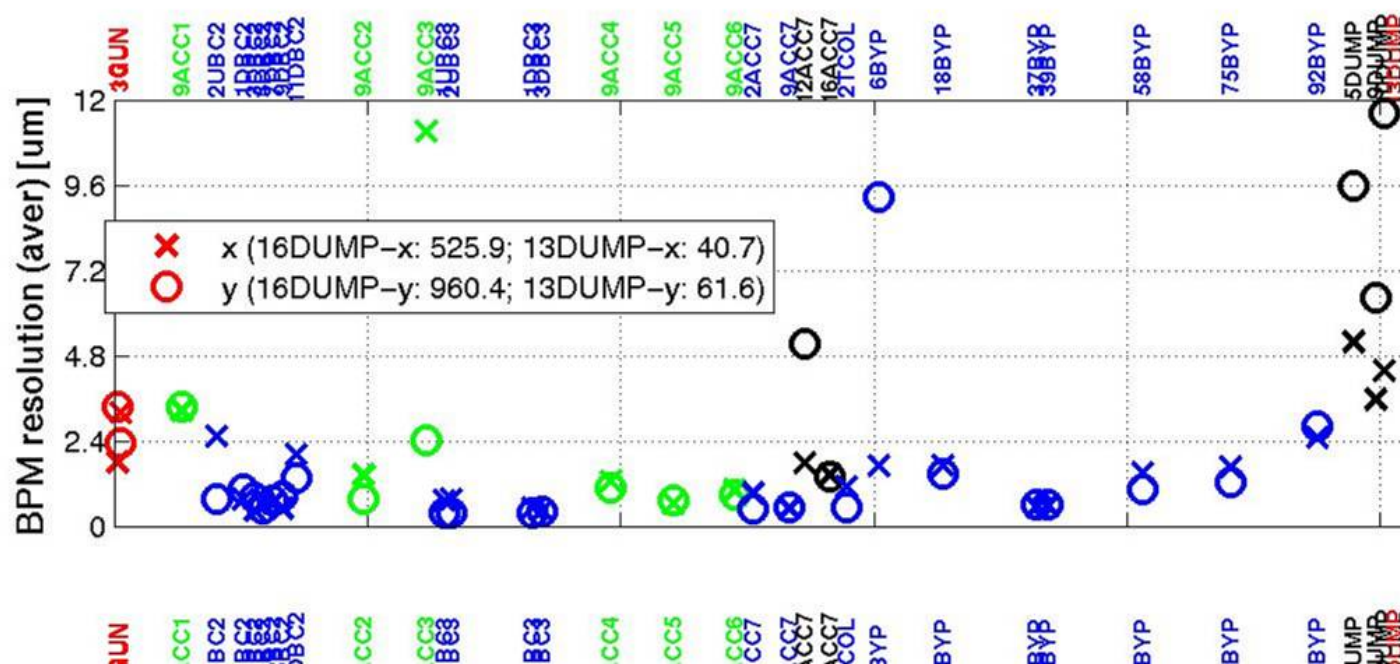
30 bunches / pulse
~ 1.2..1 nC

BPM Resolution - Multibunch - BYP Mode

200 pulses/800 bunches; Data/2009-09-20T220120/
 $q(3GUN) = 2.13 \pm 0.03$ nC; $q(9DUMP) = 2.03 \pm 0.03$ nC



button
stripline
cavity & re-entrant cavity
other



800 bunches / pulse
~ 2nC

better resolution
with multi-bunch

DUMP BPMs

- **New BPMs**

- 16DUMP: in-air magnetic-loop BPM
- 13DUMP: button BPM (same design as old 15DUMP)
- 10DUMP: button BPM

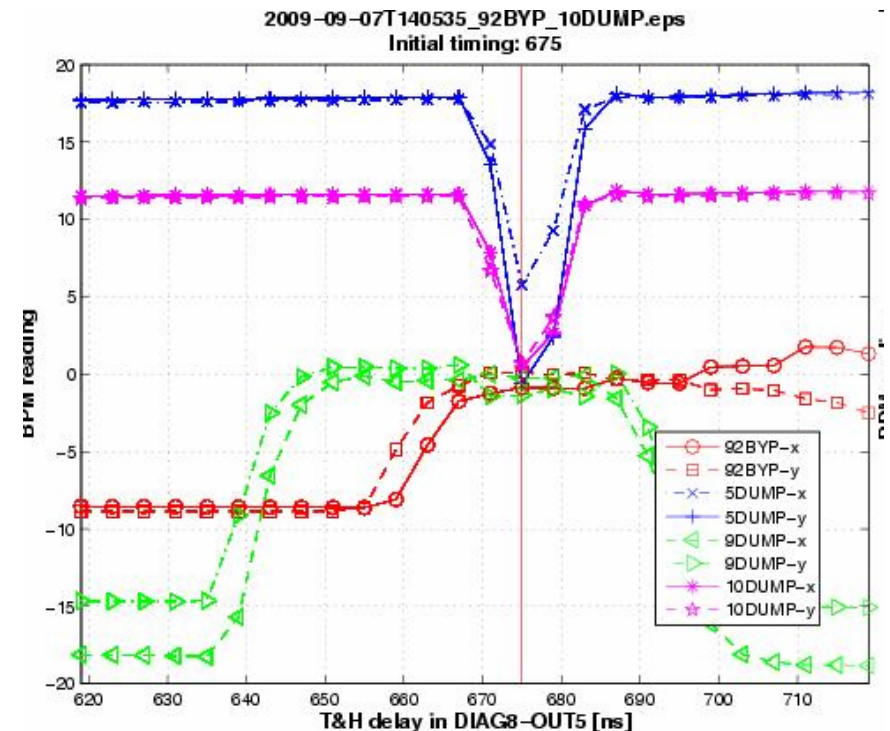
- **Set zeros for all DUMP BPMs**

- beam with offset at BPM 5DUMP for standard operation
 - need to recheck
- calibration
 - difficulties with calibration

- see talk in FLASH seminar 1. Dec. 2009

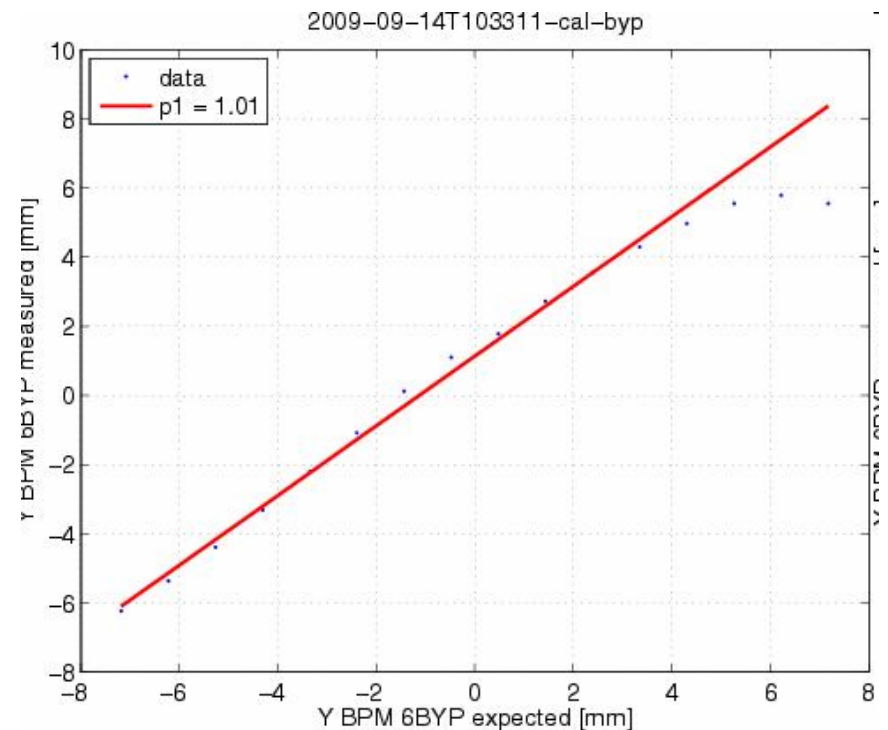
DUMP BPMs - Scan of Trigger Delay

- Double peak for 5DUMP-Y (and other button BPMs)
 - due to large charge
 - some reflections pass threshold in electronics
 - no functionality problem
 - BPMs without additional amplifier don't show this behaviour (10 ...16DUMP)



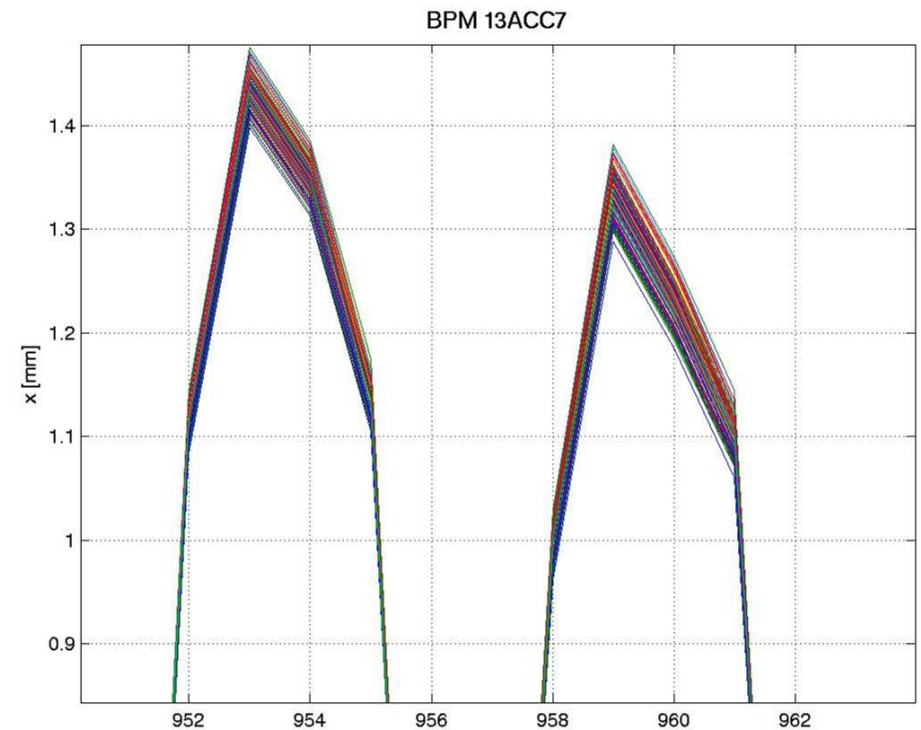
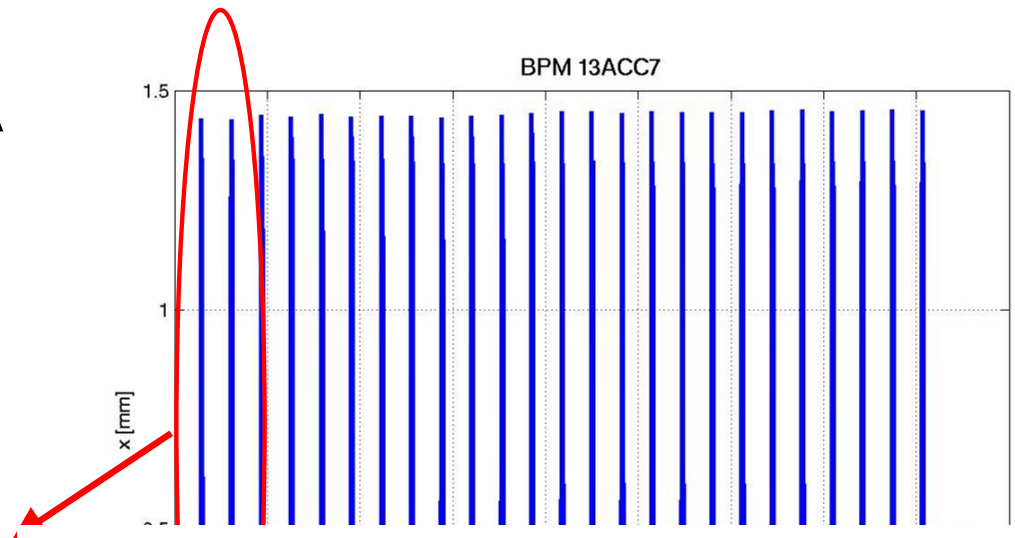
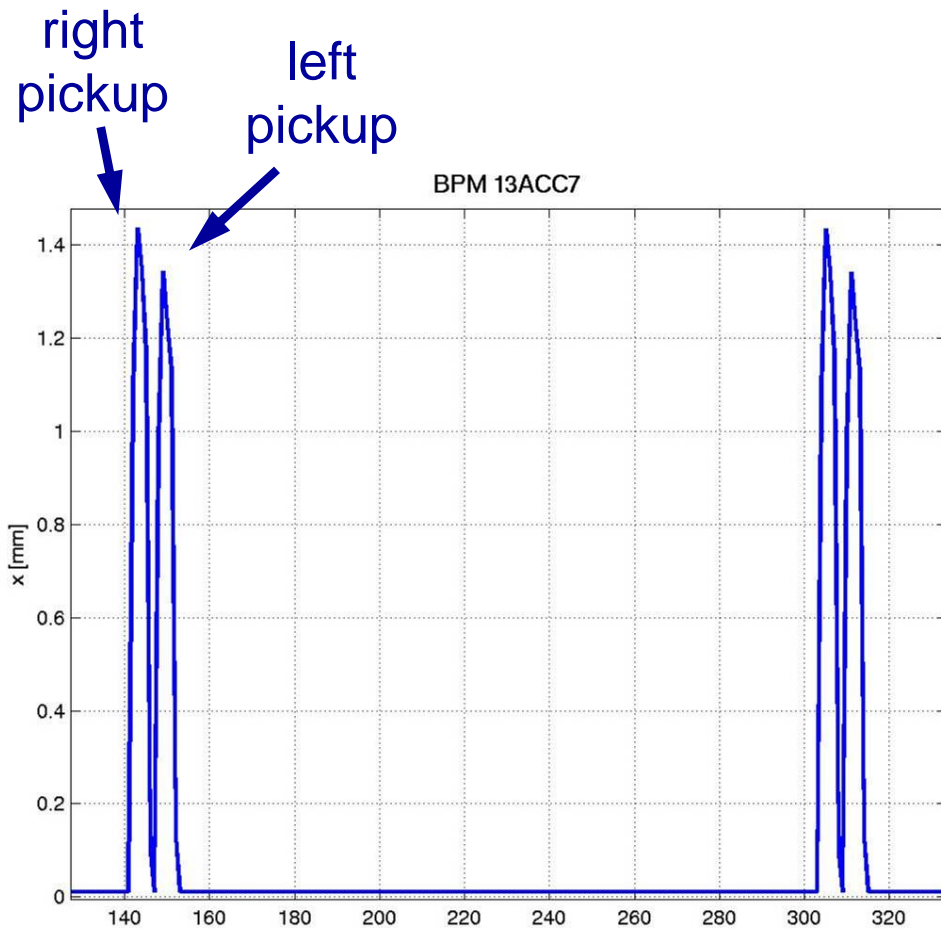
BPM 6BYP

- used by energy server in Bypass mode
 - readjusted parameters in electronics
 - re-calibrated
- electronics may have drifted over time
 - radiation problem?
 - but too little operation in Bypass mode



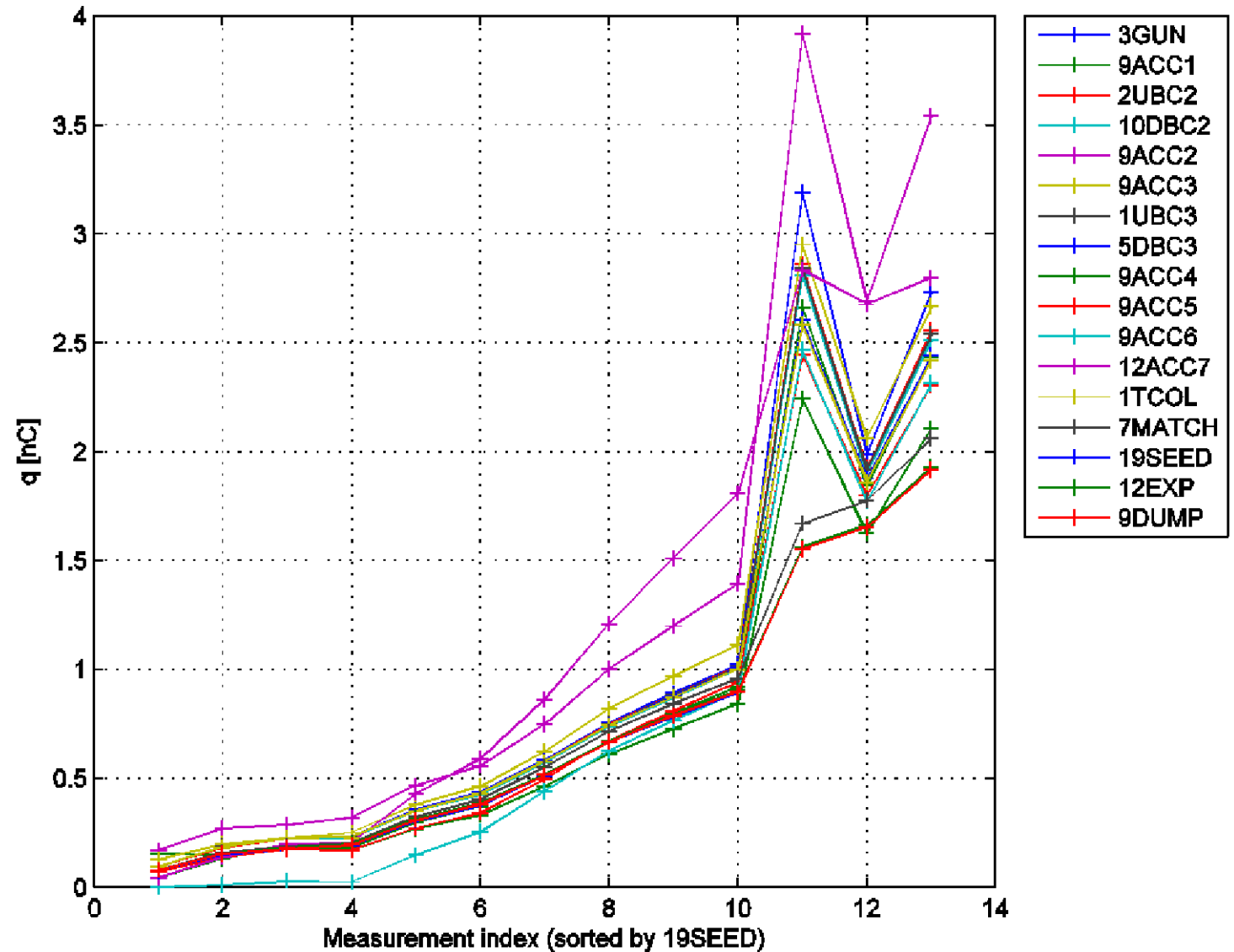
BPM Test in μ TCA-Crate

- HERA-analog-electronics in μ TCA
 - raw signals shown
- first tests with μ TCA for BPM and toroid



Toroid Resolution vs Charge

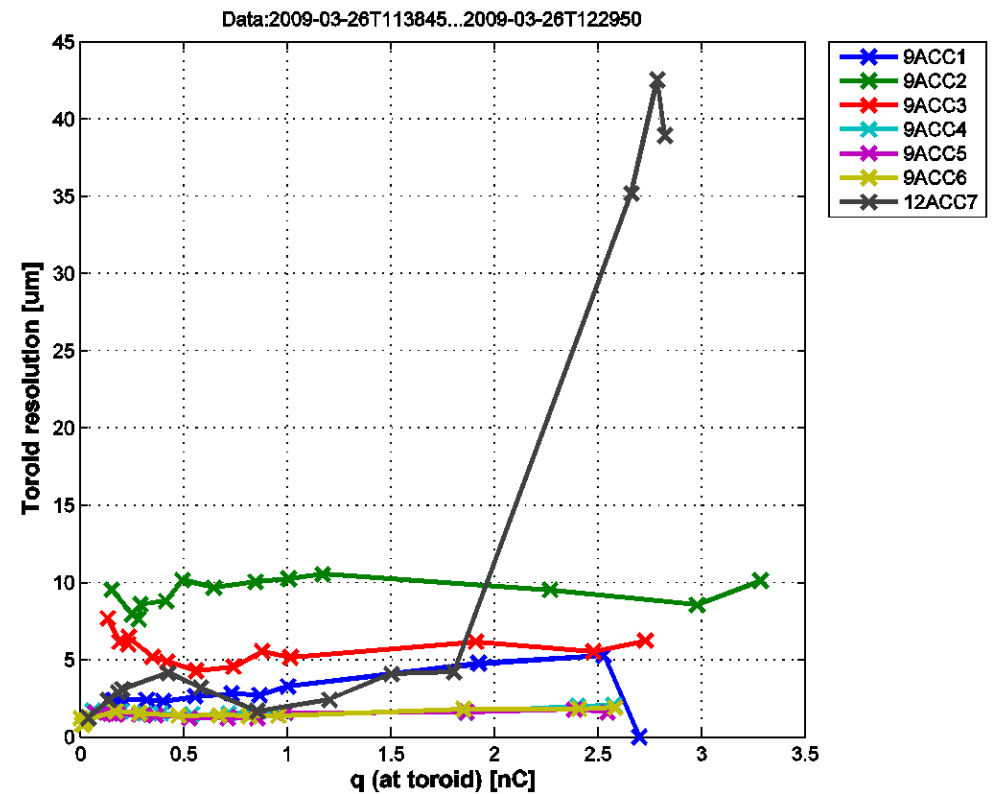
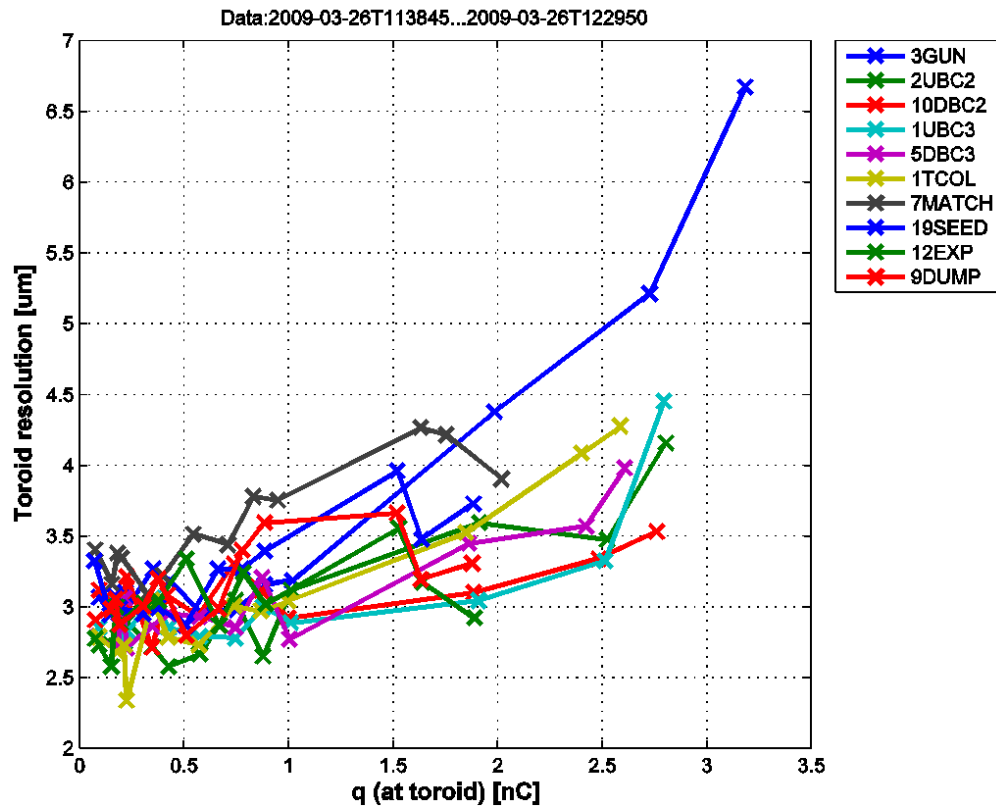
➤ Charge scan



Toroid Resolution vs Charge (2)

Toroids

Cavity and Re-entrant cavity BPMs



FLASH Upgrade - BPM Work

- **Cryo-modules**

- ACC1 – cavity BPM
 - before: re-entrant cavity
- ACC7: cold button

- **ACC7 section**

- XFEL prototype BPMs moved
- 12ACC7 (re-entrant cavity)
- 13ACC7 (button)
 - till Sep.09 button-array

- **SFLASH and ORS section**

- see table

- **EXP area**

- XFEL BPM test stand
 - Dirk Lipka's talk

BPM Changes ~160-200m

| <i>new name</i> | <i>old name</i> | <i>old Z</i> | <i>new Z</i> |
|-----------------|-----------------|--------------|--------------|
| 2SDUMP | 2ACC7 | 126284 | ca. 200m |
| 1SMATCH | 9ACC7 | 133284 | 189409 |
| 2ORS | 2MATCH | 161220 | 161135 |
| 12ORS | 6MATCH | 164562 | 170765 |
| 7ORS | 4SUND2 | 175708 | 166065 |
| 9ORS | 3SEED | 184689 | 168055 |
| 6SMATCH | 12SEED | 193669 | 194206 |
| 13SMATCH | 20SEED | 201756 | 201465 |
| 1SFELC | SPARE | *** | 184330 |
| 1SFUND2 | new | *** | 174493 |
| 1SFUND3 | new | *** | 177193 |
| 1SFUND4 | new | *** | 179893 |
| 14SMATCH | 21SEED | 203135 | 203135 |

Summary

- **BPM status**

- Multi-bunch resolution better than single bunch
- Difficulties with BPM calibration in DUMP area

- **BPM studies**

- first tests of μ TCA tested with BPM
- toroid resolution vs charge
- self-trigger tests: on-going work

- **FLASH upgrade**

- many BPM changes in ACC7, SFLASH and EXP
- to be commissioned