

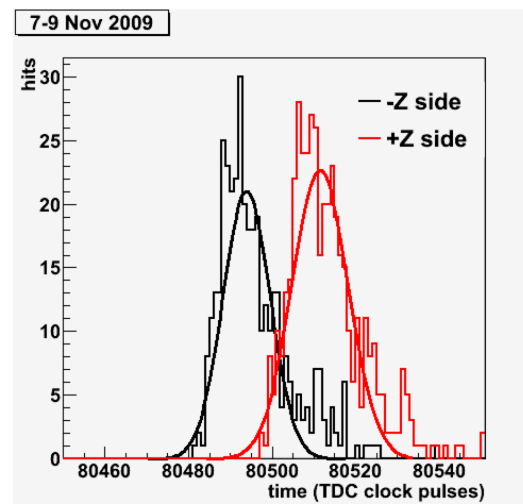
BCM1-F:  
An Application of sCVD  
Diamonds in CMS  
- Status April 2010 -

Wolfgang Lange, DESY Zeuthen

# Short History

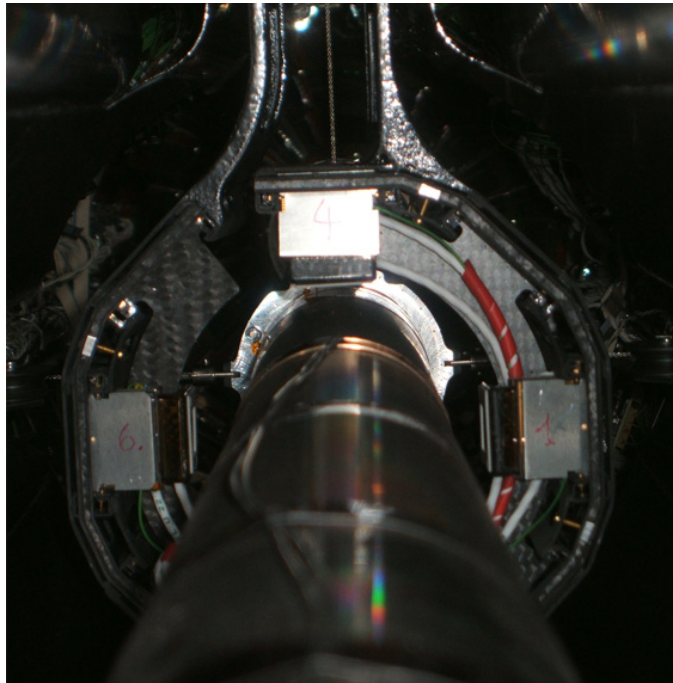
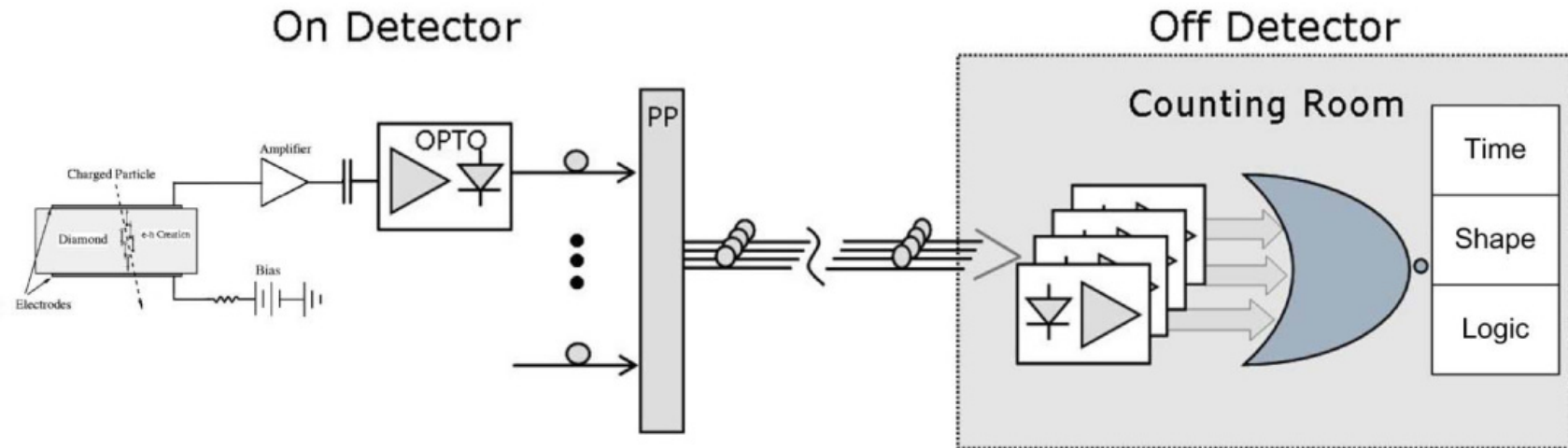
- First Installation in 2008 → first beams of LHC seen
- 2008 / 2009 repair of LHC, CMS pixel improvements → removed
- reinstallation and test of BCM1F after LHC being repaired
- registration of beam signals right from the first splash events:

## Splash events - timing



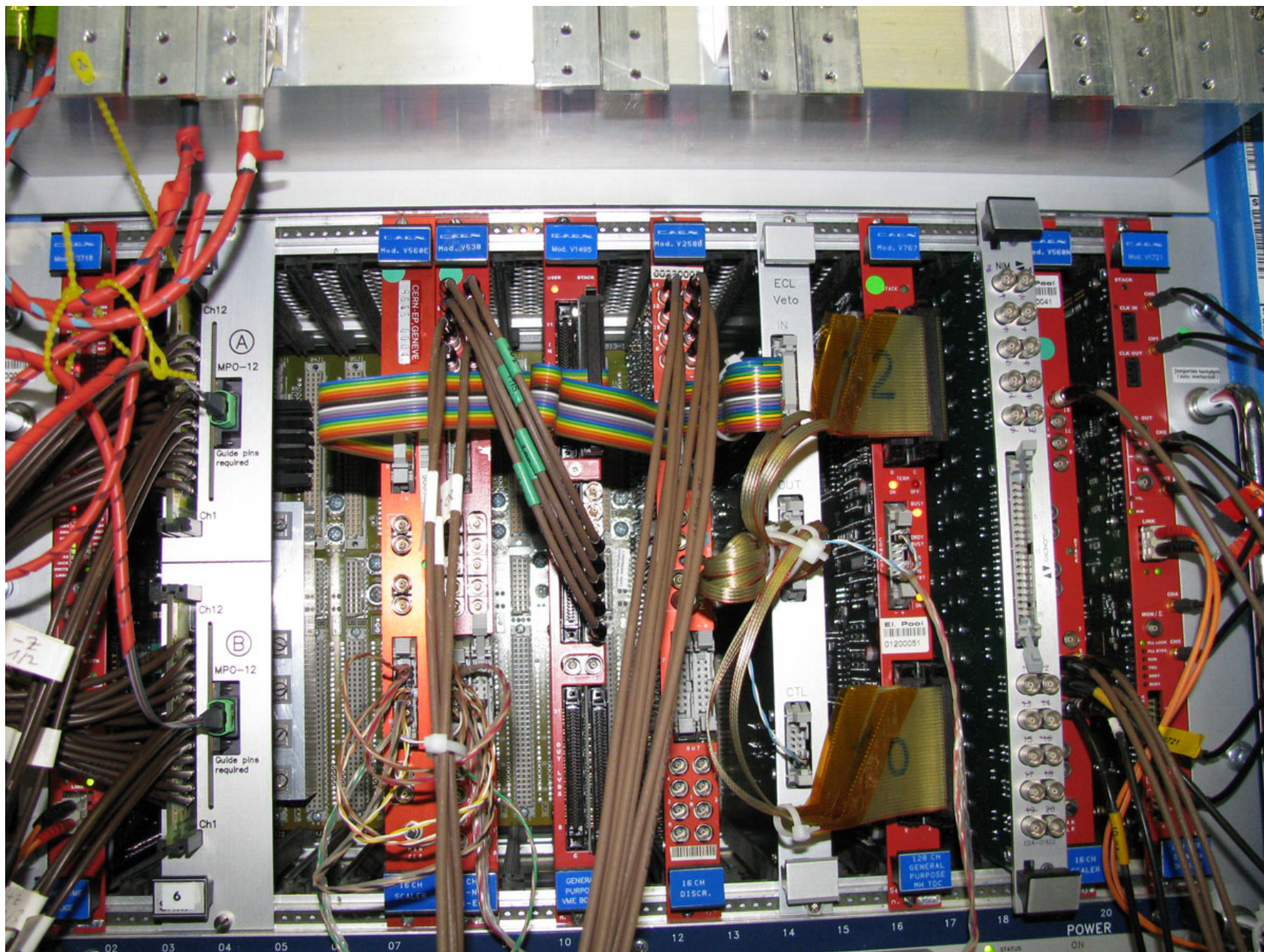
- Fit -Z  
mean:  $80493.9 \pm 0.5$   
sigma:  $5.6 \pm 0.4 \sim 4\text{ns}$
- Fit +Z  
mean:  $80511.4 \pm 0.4$   
sigma:  $6.7 \pm 0.4 \sim 5\text{ns}$
- Time difference **13.7 ns.**  
Expected 12 ns.

# Hardware Review



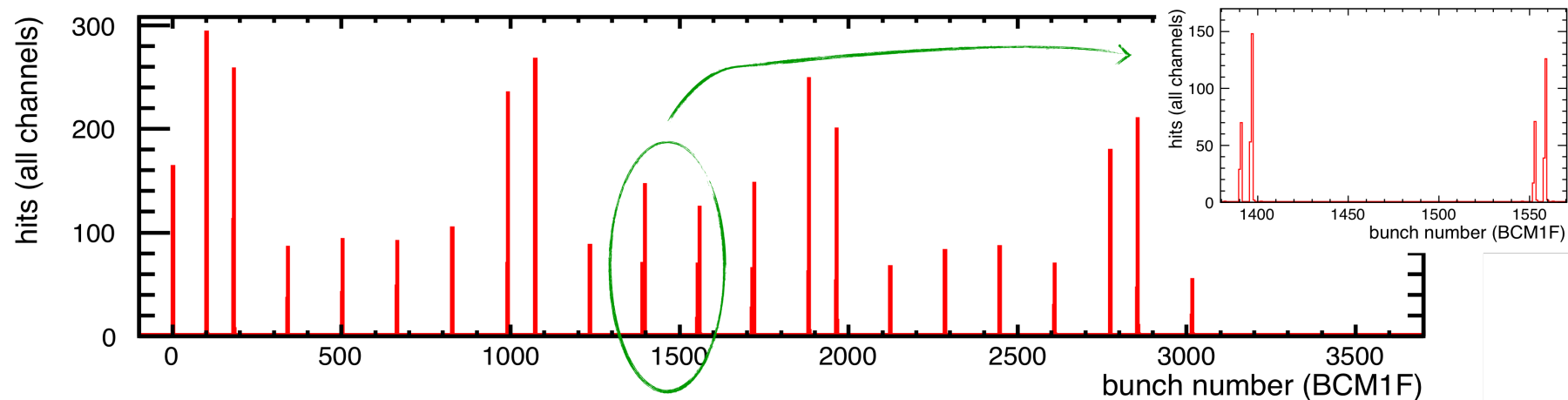
- 2 planes:  $Z^+$  and  $Z^-$  (1.8 m from IP)
- 4 modules per plane (see right)
- analog optical signal transmission to S1
- use of ADC, (Discr.), TDC, Counters
- use of 'look-up table' prepared





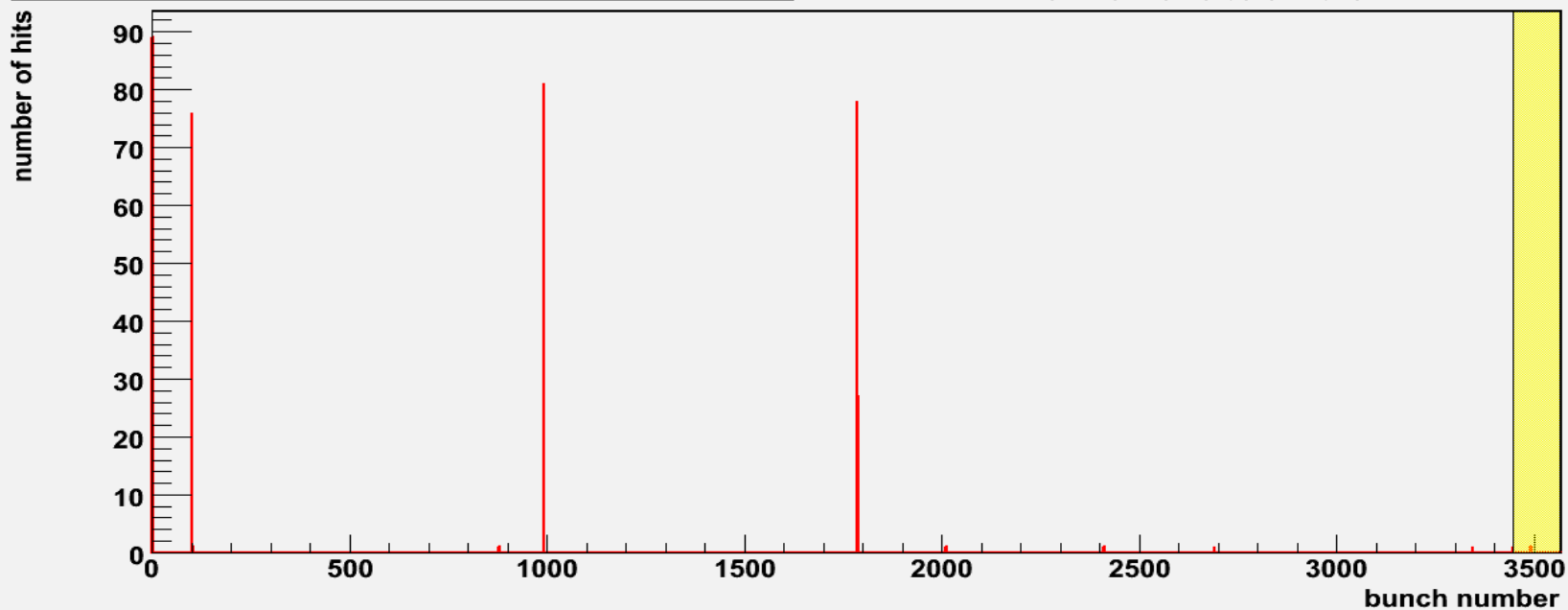
# BCM1F observes LHC:

Bunch number (beam1 + beam2)



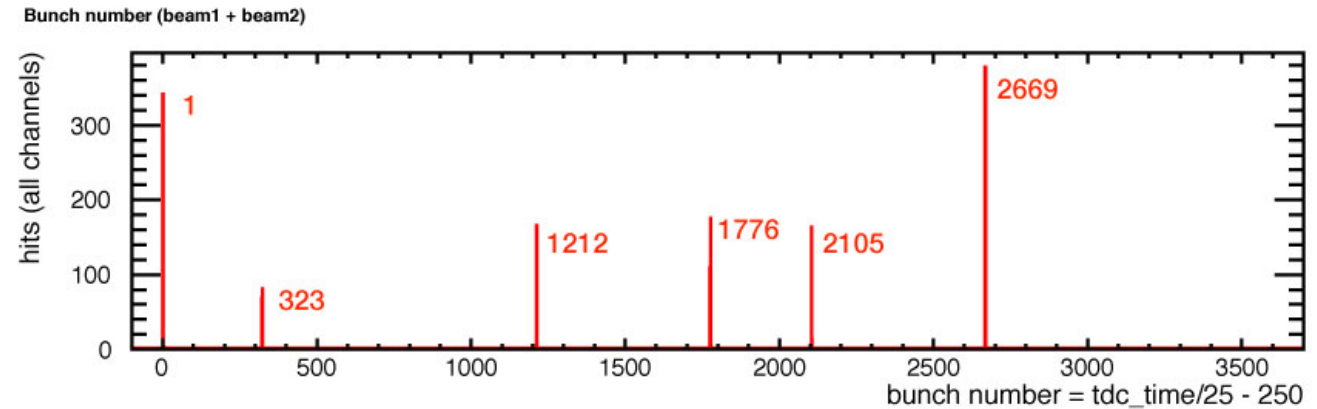
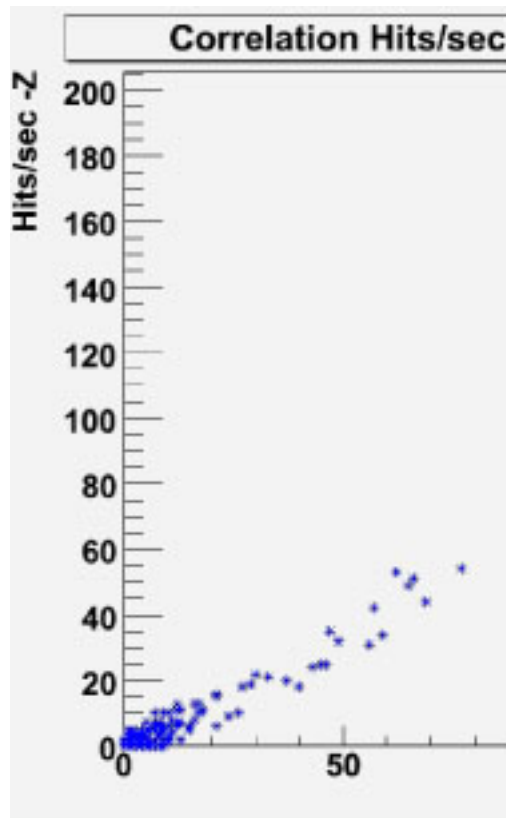
CMS Fast Beam Condition Monitor (BCM1F)

Mon Mar 29 23:58:01 2010



# BCM1F Measurements:

- 3x3 bunches (bunch 1 = pilot bunch(?))
  - Beam 1: [1, 324, 2109, 2674]
  - Beam 2: [1, 1215, 1780, 2674]



# Conclusions

- BCM1F is a very helpful tool for diagnosis (bunch by bunch)
- count rates from BCM1F are displayed in the main LHC control room
- improvement of system software and operation
- adding a 'look-up table' allows for new applications:
  - correlated particles from IP (elastic scattering)
  - ...