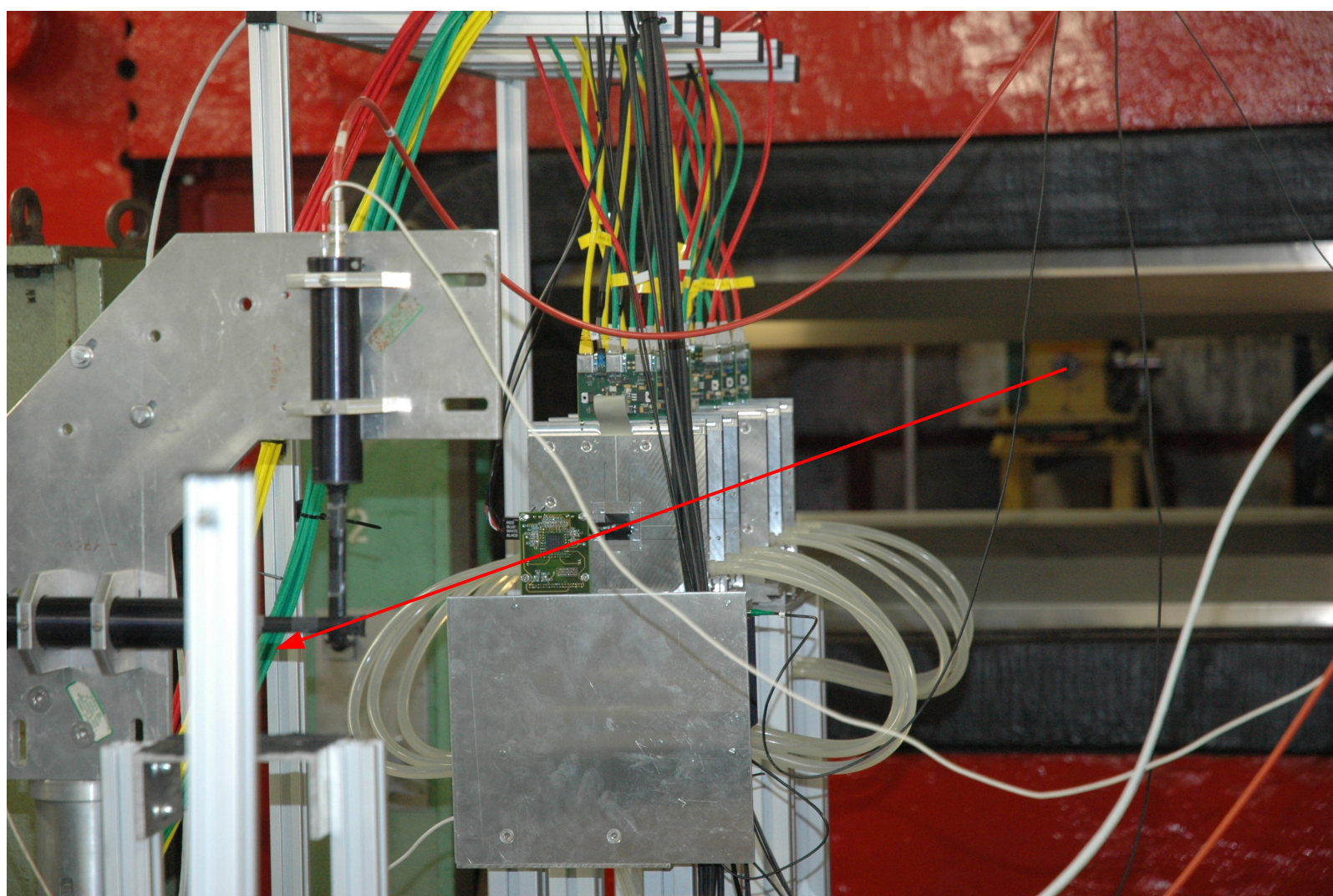


Pixel test plans

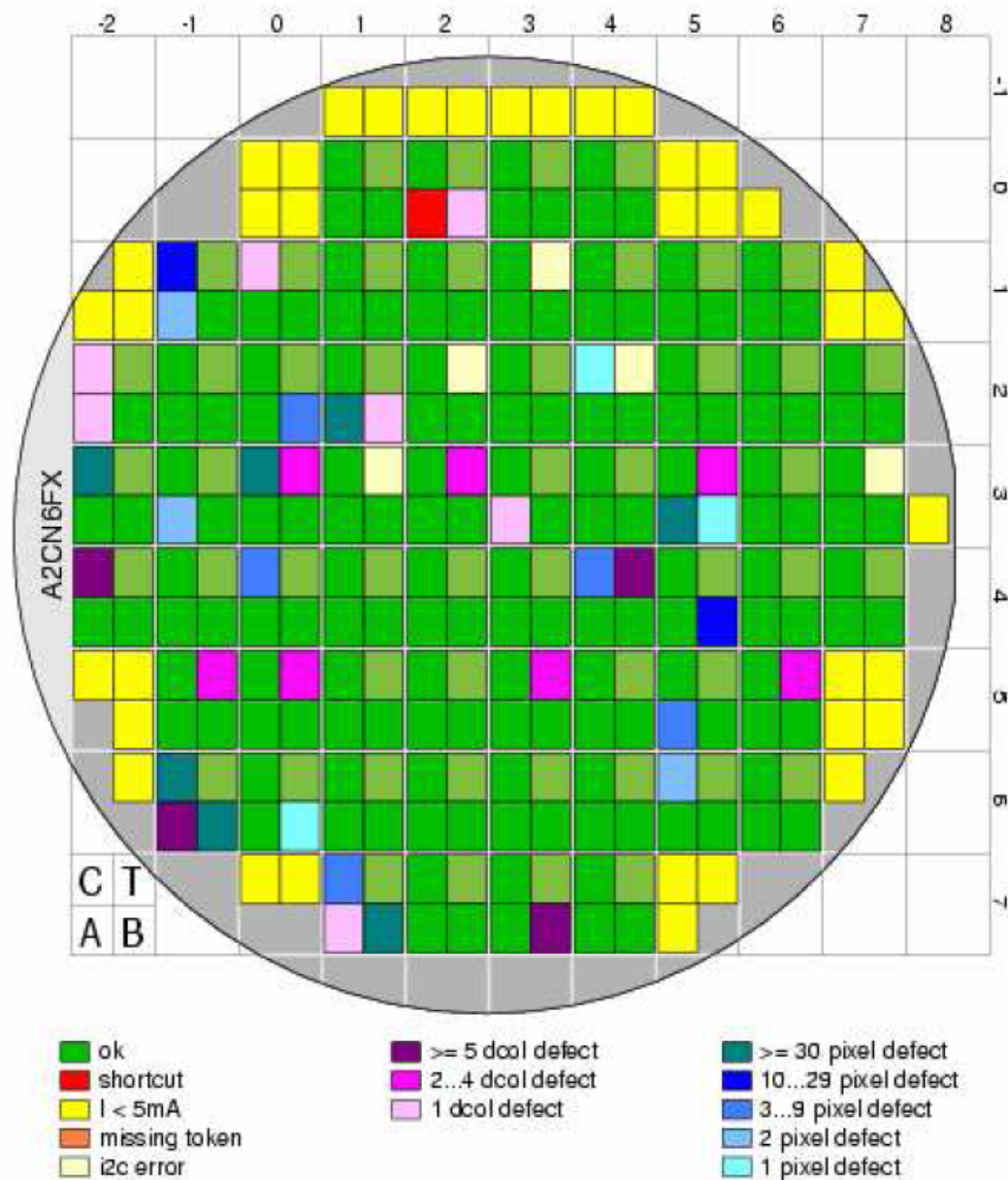
Daniel Pitzl, DESY

Pixel upgrade, 15.11.2011



- schedule
- beam test
- lab tests
- X-ray test

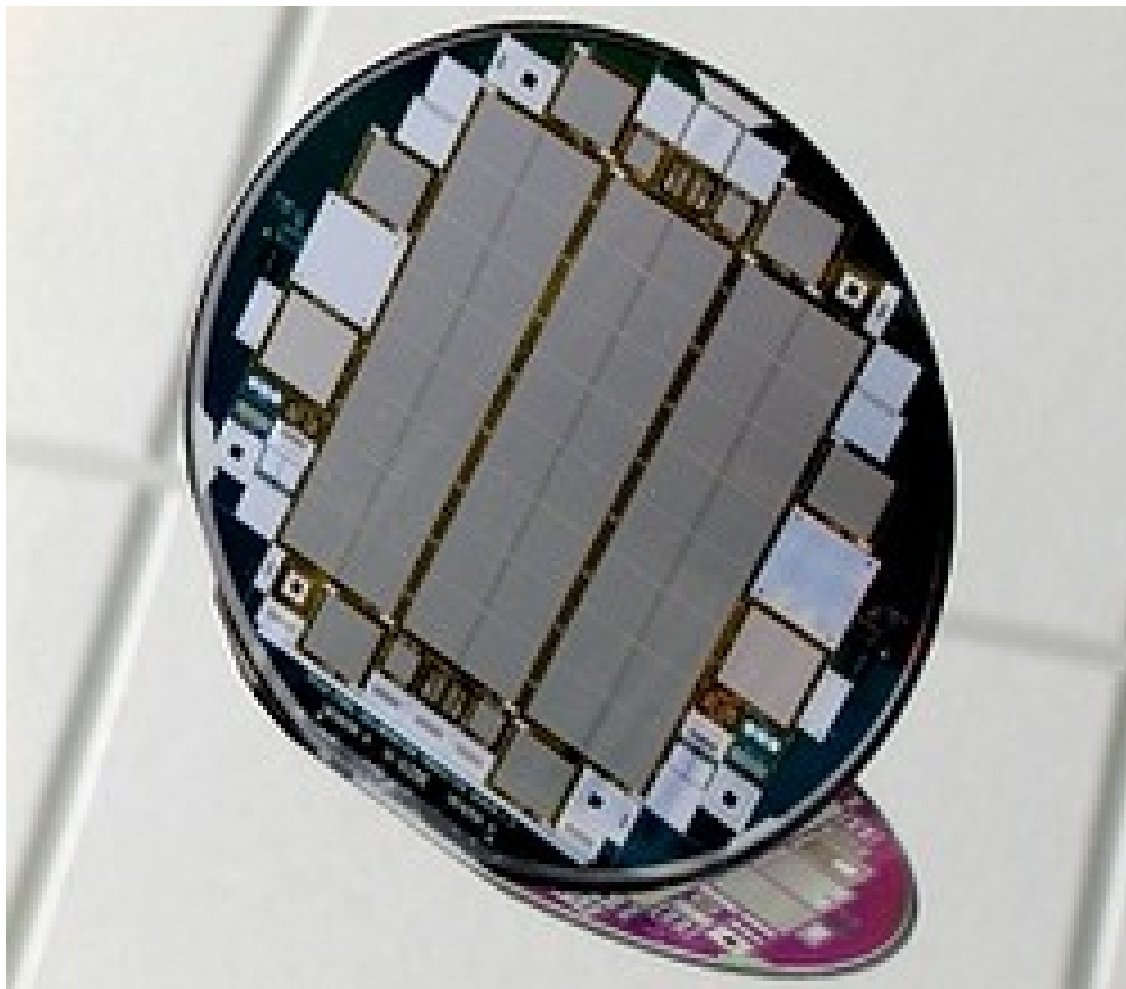
CMS Pixel ROC



- Produced by IBM on 200 mm wafers.
- 64 recticles / wafer.
- per recticle:
 - PSI46xdb (ready)
 - PSI46dig (ready)
 - TBM (mid Dec)
- CMS will get 6 wafers.
- 4 months production time
- Expected in April 2012.
- Test in lab, beam, X-ray.

Hans-Christian Kästli, Beat Meier (PSI)

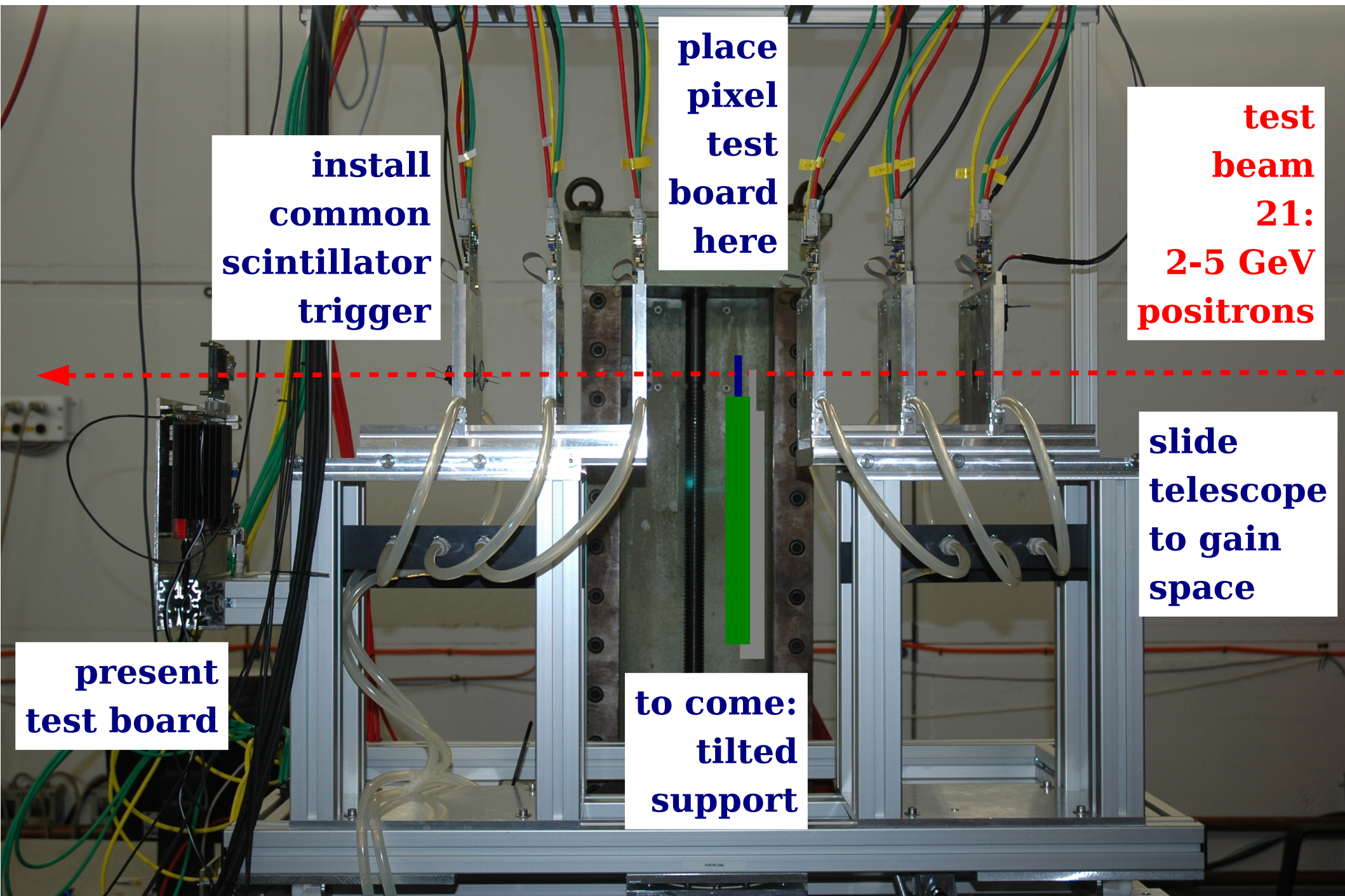
CMS Pixel Sensors



design: Tilman Rohe, PSI

- 60 wafers under production at CIS (Erfurt)
 - standard CMS pixel sensor design (double sided, n-in-n, p-spray insulation).
 - for Karlsruhe, INFN, CERN/Taiwan, MRI, Purdue, DESY.
 - 5 wafers with increased bump pad passivation opening: 30 μm , for DESY.
 - Delivery in Feb 2012.
- Full sensors for first bump bondings.
- Single chip sensors for tests with new ROCs.

CMS Pixel with EuTelescope



**install
common
scintillator
trigger**

**place
pixel
test
board
here**

**test
beam
21:
2-5 GeV
positrons**

**slide
telescope
to gain
space**

**present
test board**

**to come:
tilted
support**

Test beam

- this year:
 - software installed (ILCsoft: Marlin, LCIO, Millepede...) Daniel, Armin
 - common scintillator trigger Hanno, Daniel
 - take take: CMS pixel + telescope Daniel, Hanno, Shiraz, Armin, Luigi
 - analyse data Daniel, Shiraz, Armin, Luigi
 - design and build tilting support Adam Zuber, Holger Maser
 - take data at various angle of incidence all
 - implement broken line track fit Daniel, Thomas
 - <https://wiki.terascale.de/index.php/GeneralBrokenLines> (C.Kleinwort, V.Blobel)
- 2012:
 - prepare for new readout chip (PSI46xdb) Daniel, Alexey, Shiraz
 - take data with new readout chip all
 - study efficiency Armin
 - study resolution Luigi

DESY test beam: **proposal**

2011

Beam	Responsible	July				August				September				October				November				December					
	Collaboration/Subdetector	04	11	18	25	01	08	15	22	29	05	12	19	26	03	10	17	24	31	07	14	21	28	05	12	19	26
All	NO BEAM																										
	July/Aug. FIXED																										
21	Gregor																										
	Telescope																										
21	Garutti/Terwort																										
	CALICE																										
21	Jeans																										
	CALICE/SiW ECAL																										
21	Gregor																										
	Summer Student																										
21	Eckstein																										
	CMS																										

2012

Beam	Responsible	January					February					March					April					May					June				
	Collaboration/Subdetector	02	09	16	23	30	06	13	20	27	05	12	19	26	02	09	16	23	30	07	14	21	28	04	11	18	25				
ALL	NO BEAM																														
	To be confirmed																														
21	Garutti																														
	CALICE																														
21	Weingarten																														
	ATLAS/PPS,IBL,3d,Dia																														
21	Vos																														
	DEPFET/APD																														
21	Pitzl																														
	CMS Pixel																														
21																															

<http://adweb.desy.de/~testbeam/>

testing procedures

- chip testing in the lab:
 - determine operation parameters for new chips well advanced
 - bare module test with probe card to be done
- stand-alone source and test beam established
- efficiency:
 - pixel w.r.t. to telescope to be done
 - $\text{eff}(x,y,dac) = \text{hits} / \text{tracks}$ to be done
- resolution:
 - pixel residuals w.r.t. telescope tracks to be done
- low temperature testing: cold box being designed
- X-ray test Uni HH

PSI46 test board at DESY

