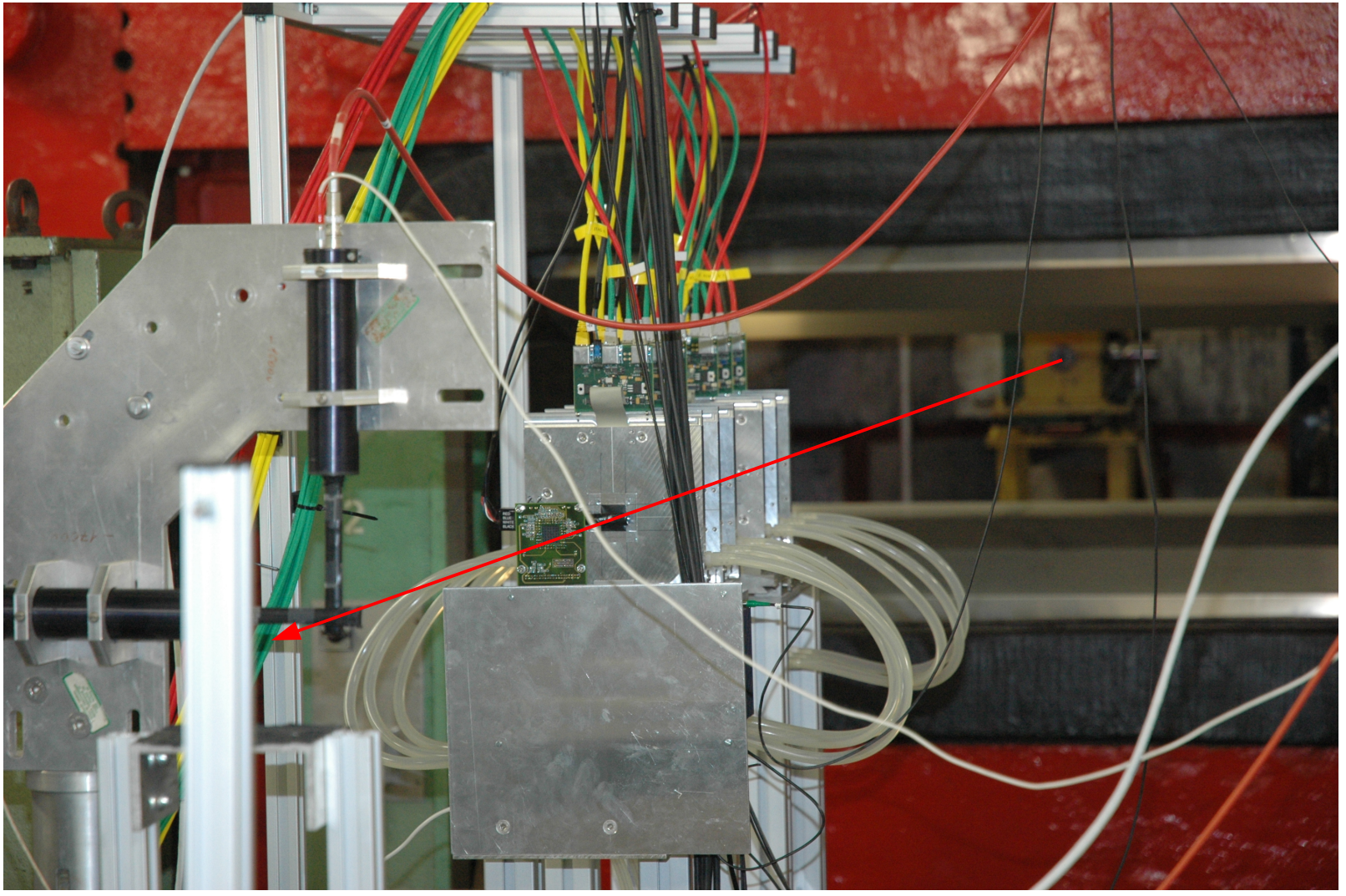
Pixel test plans

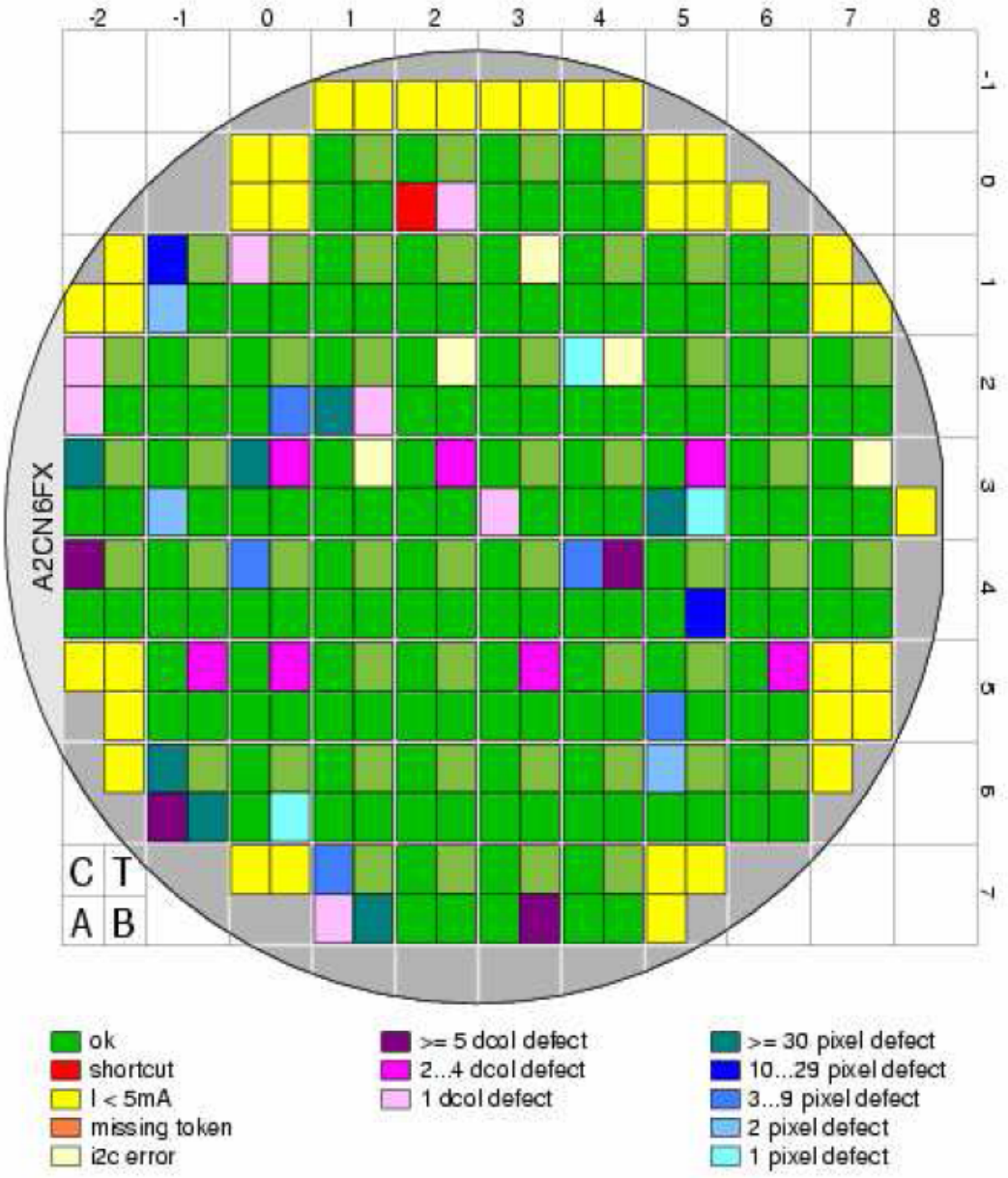
Daniel Pitzl, DESY

Pixel upgrade, 15.11.2011



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

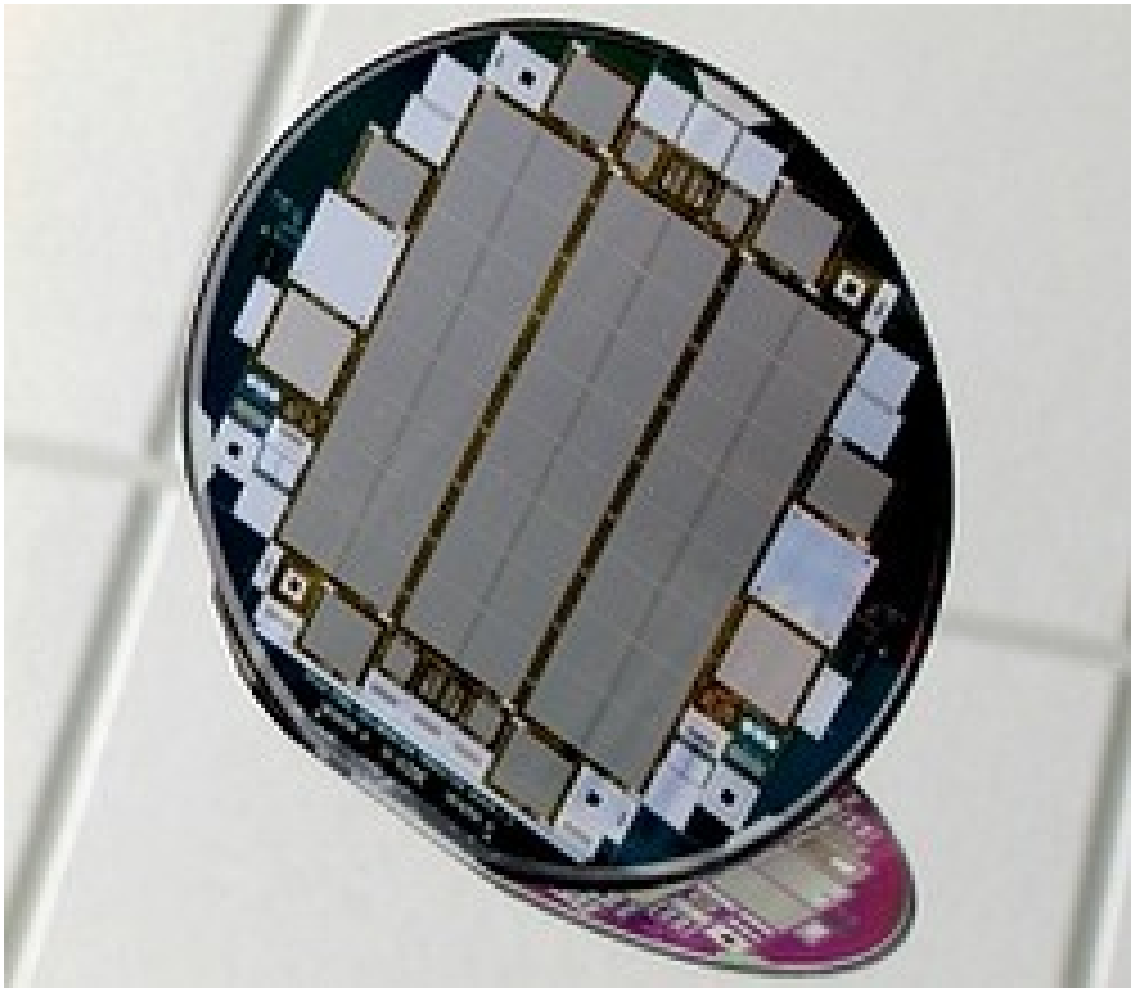
CMS Pixel ROC



- 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)

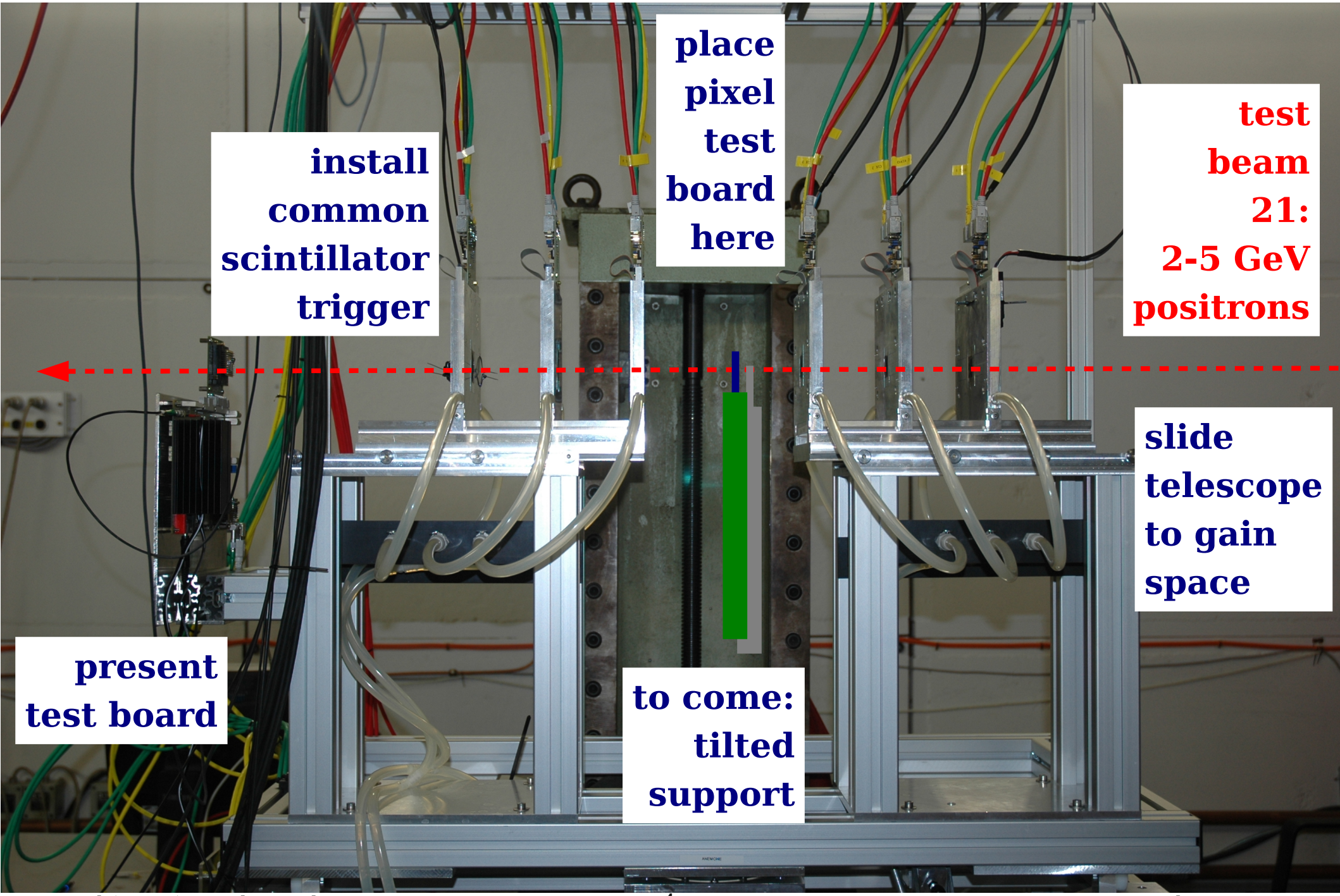
CMS Pixel Sensors



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.

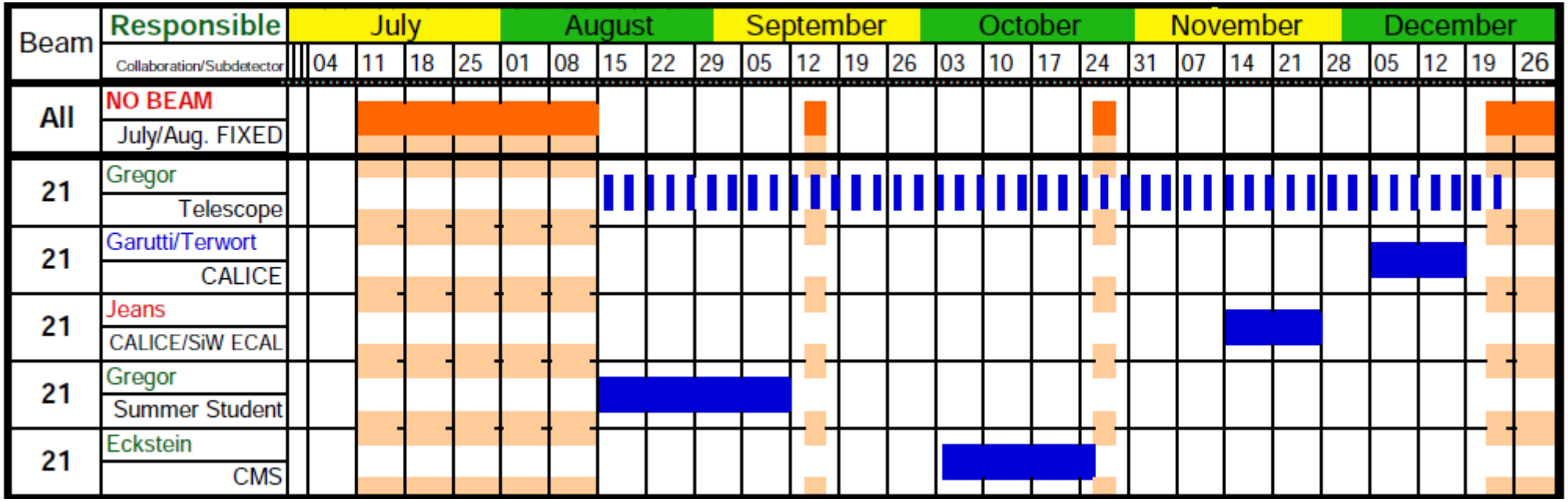
CMS Pixel with EuTelescope

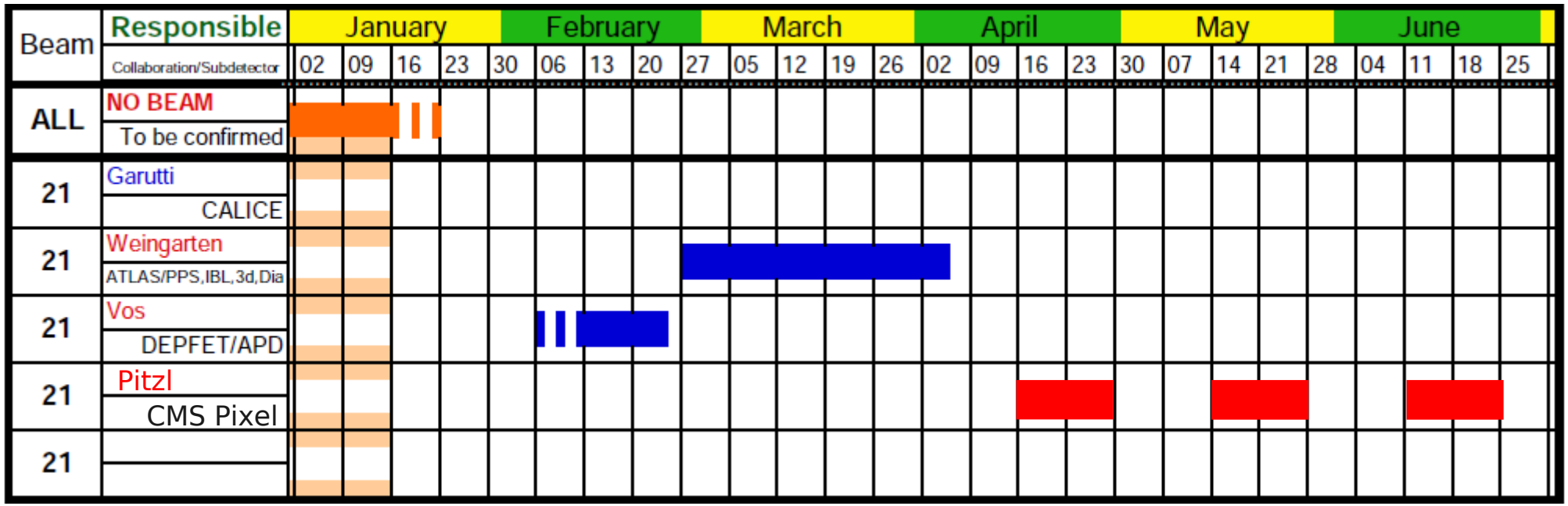


Test beam

- 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





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
  - eff(x,y,dac) = hits / 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