QA

The

Solid State Detector Section (TA1-SD)

and the

Divisional Silicon Facility (DSF)

at CERN

- some background
- our activities
- DSF

"CERN" would like ...

- to group and strengthen support for solid state detectors (SSD)
  $\rightarrow$ sharing of facilities / access to centrally maintained services
- to concentrate current SSD R&D projects. Bring people together who work on similar topics
- to continue and intensify SSD R&D for future experiments (LHC upgrade, Linear collider, etc.).

Much will depend on support by experiments and member states !

A new section has been created in January 2001 dedicated to support and R&D in the field of solid state detectors http://cern.ch/ssd-rd/

EP / TA1 - SD =

Experimental Physics Div. / Technical Assistance Group 1 - Solid State Detectors

TA1-SD

http://cern.ch/ssd-rd/

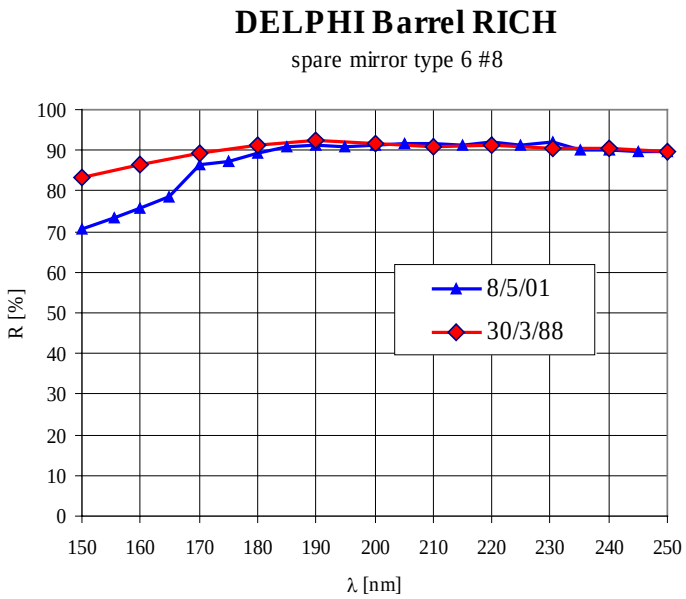
Who are we and what are we doing ?

Staff: 3 phys., 2 eng., 3 tech., 2 ind. tech., 2 stud.

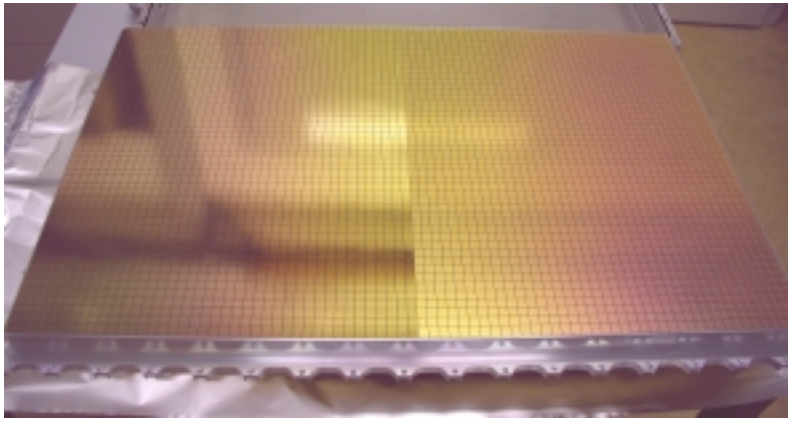
Our activities

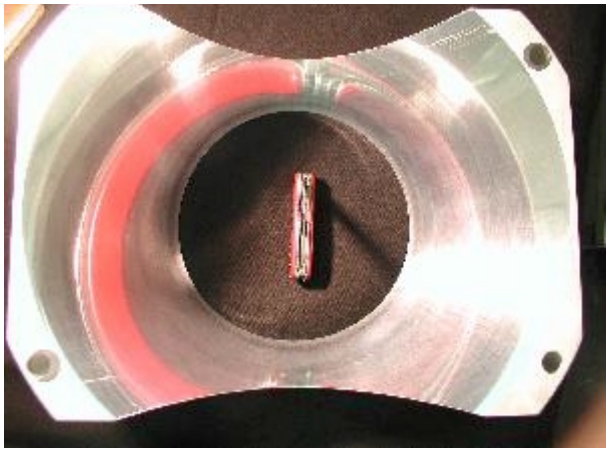
- Thin films (CsI PC, mirrors) + glass, fabrication & characterization — A. Braem
- Development of the Pad HPD (Hybrid Photodiode) — C. Joram
- Irradiation and characterisation of Si sensors and electronics — M. Glaser
- Radiation hardness studies (formerly ROSE / RD48) — M. Moll
- Wire Bonding — K. Mühlemann, I. Mcgill, supervized by A. Honma (CMS)
- Divisional Silicon Facility — C. Joram, A. Honma

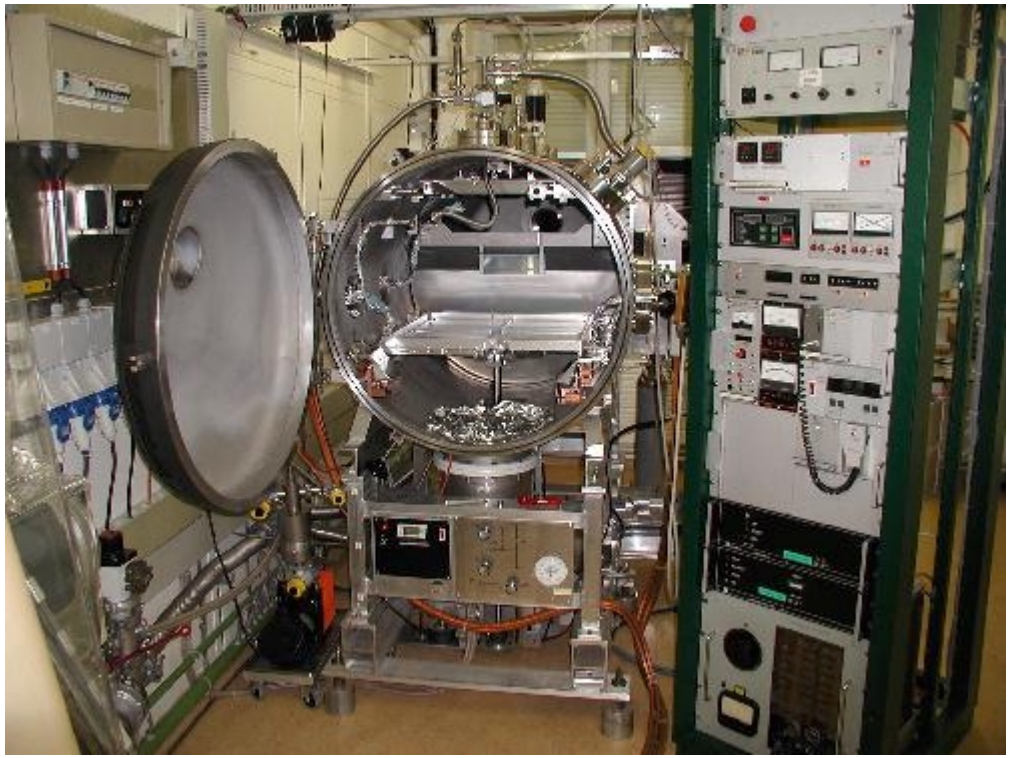
Thin film + glass activities



ALICE
COMPASS
HARP
...

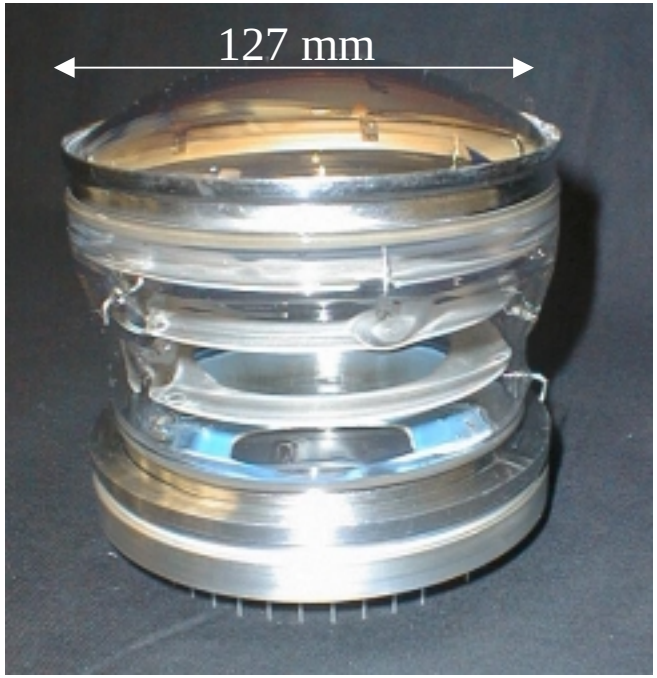


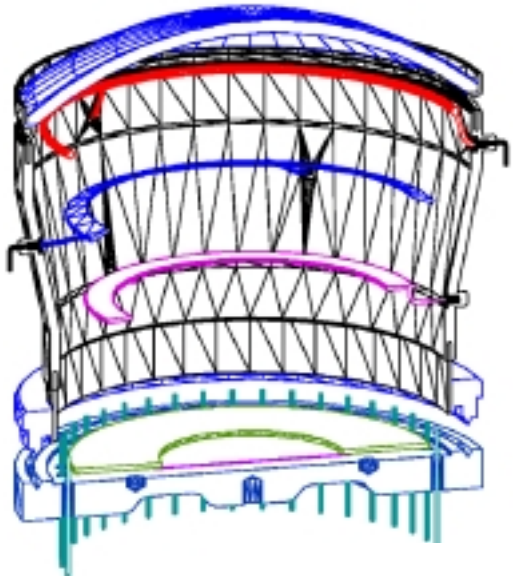


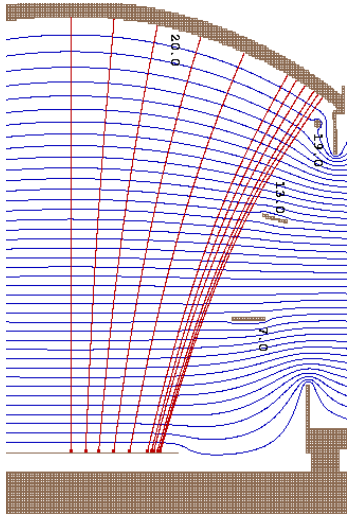


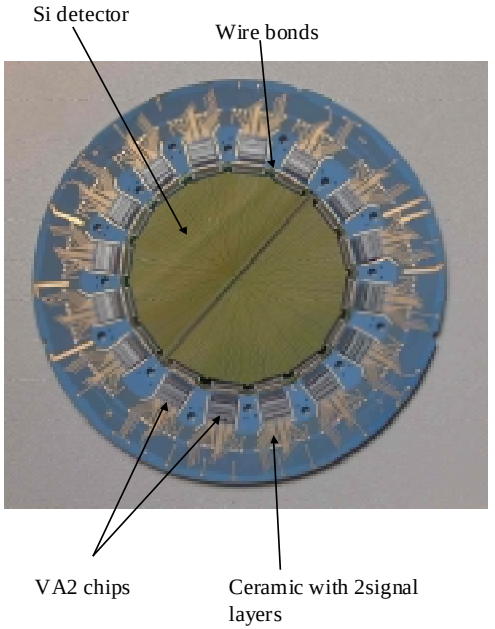
The Pad HPD R&D project

Hybrid Photodiode with visible light PC and pixelized (2048) silicon anode

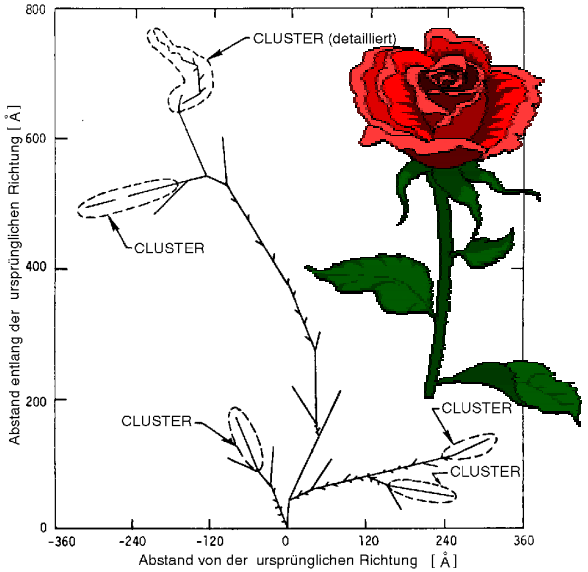






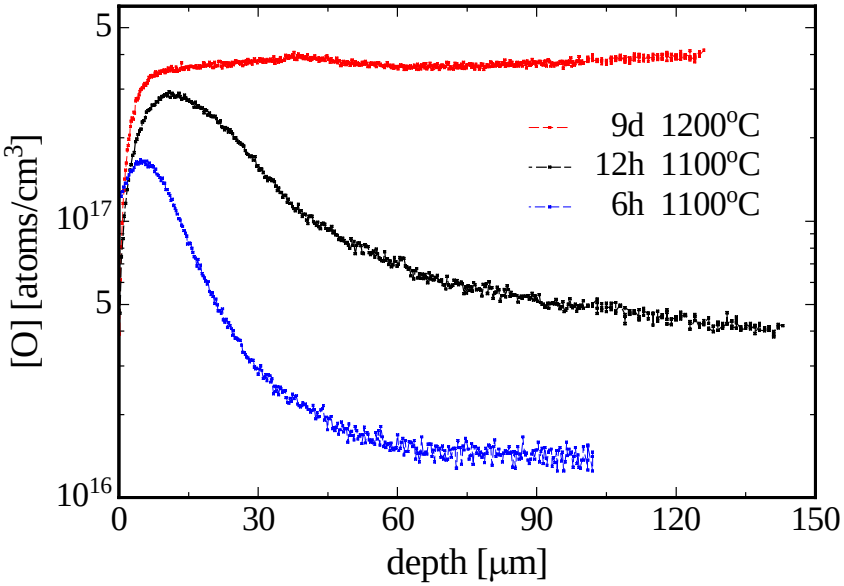


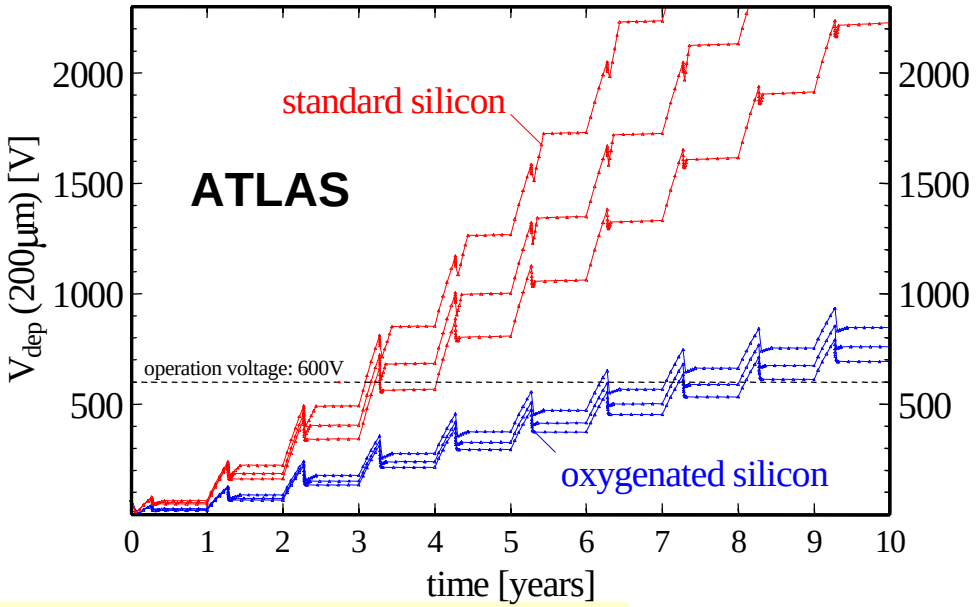
Radiation Hardness studies
(ROSE / RD48)



More details in Michael's talk tomorrow.

DOFZ - Diffusion Oxygenated Float Zone

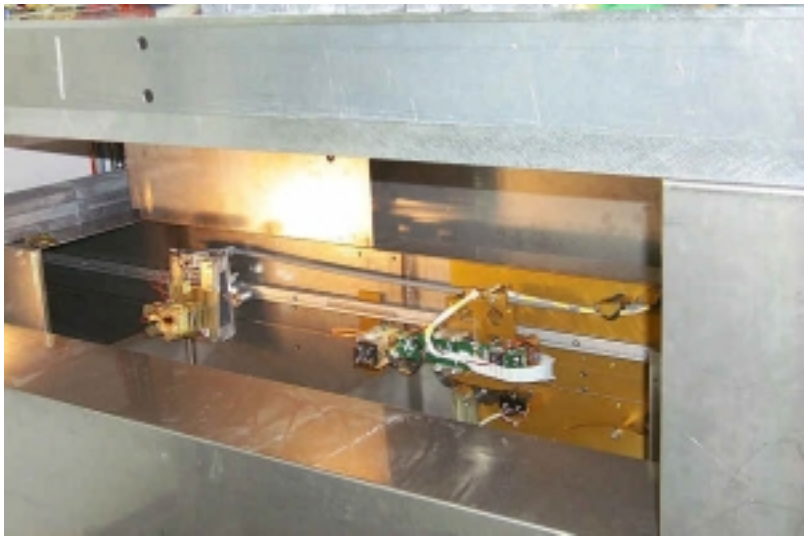


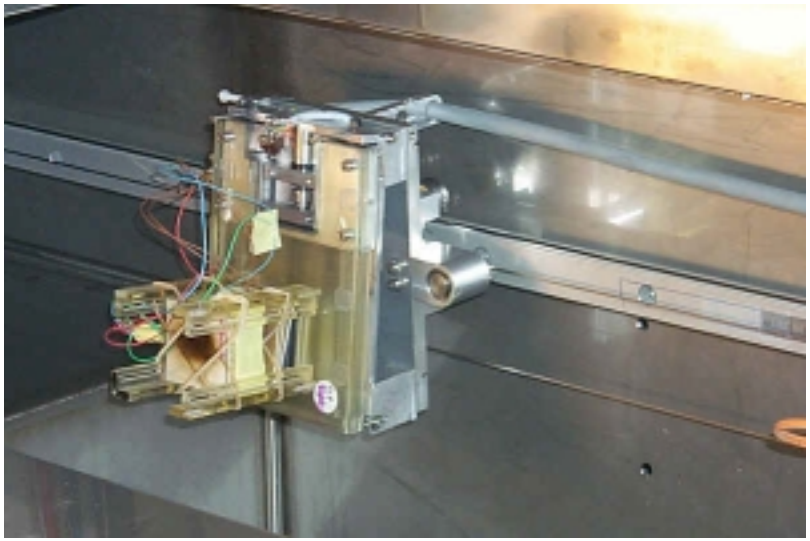


Irradiation and characterisation of detectors and electronics

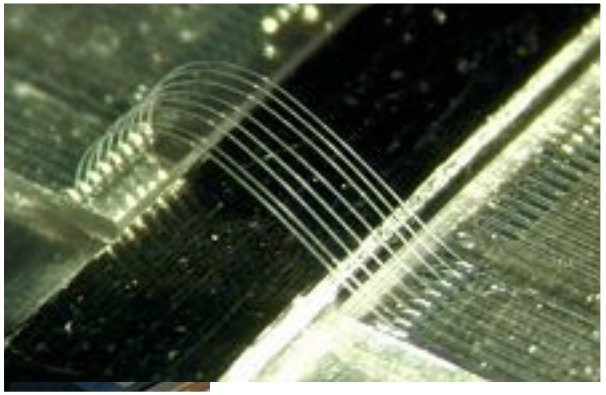
- 4 shuttle systems in PS complex (protons, 24 Gev/c, neutrons 1 MeV)

More details in Maurice's talk tomorrow.

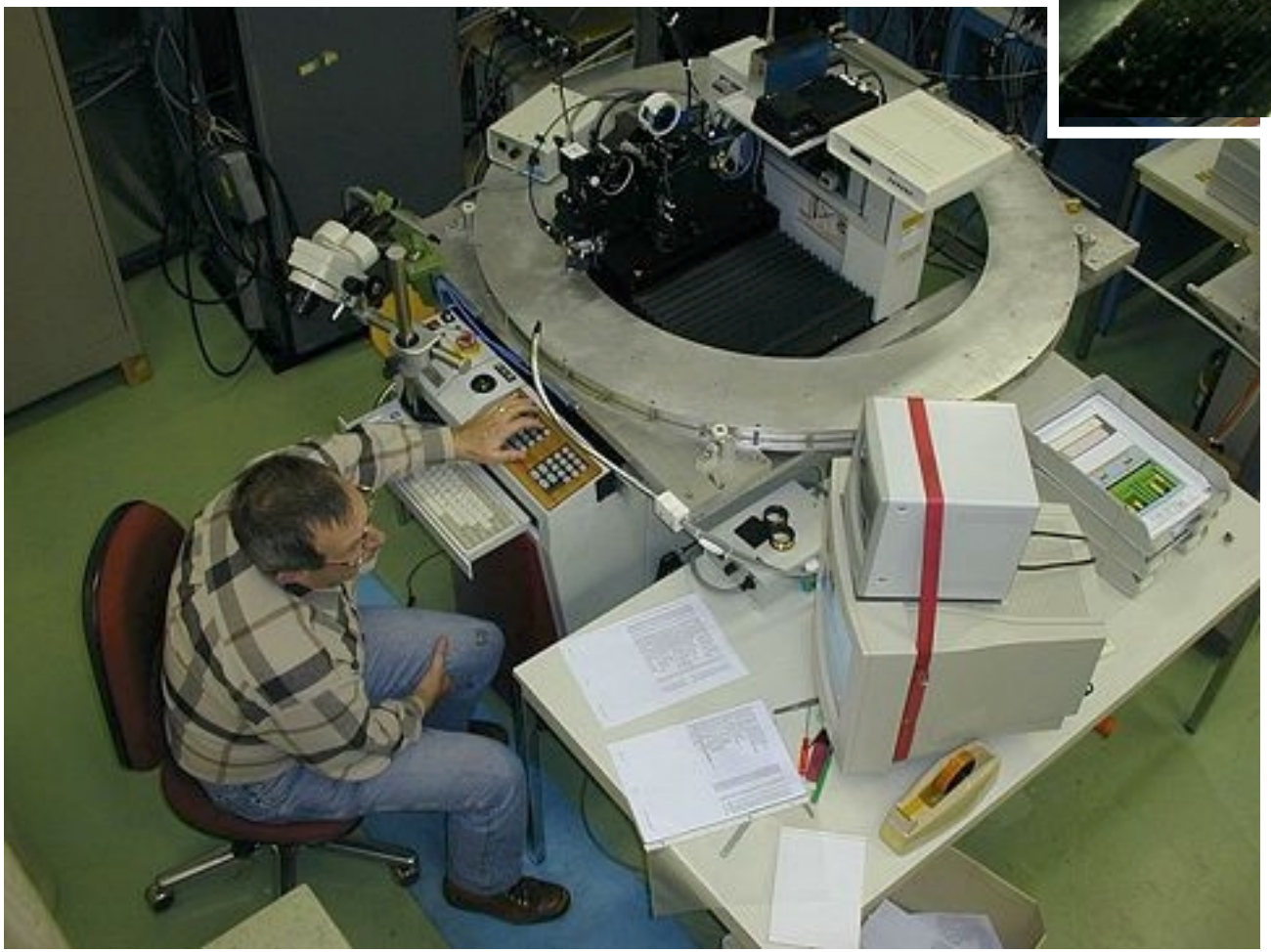




Wire bonding of sensors and hybrids



http://cern.ch/ssd-rd/seminar/transparencies/01-04-04-ss-alan-honma.pdf



Divisional Silicon Facility

The Divisional Silicon Facility

Purpose

Provide appropriate space and basic technical facilities for
- bonding
- assembly
- testing
- modifications
- repair
- R&D

} of solid state detectors

Basic idea

Group the assembly and test areas of LHC experiments around a common bonding lab under responsibility of division (EP/TA1-SD).

Bonding lab is open to all users (also non -LHC ones)!

Divisional
Silicon
Facility

What are the requirements of the LHC experiments ?

- access to bonding lab: all 4 experiments.
- assembly and test zones:
  - ALICE ca. 200 m2
  - ATLAS ca. 300 m2
  - CMS 1000m2 (will prepare a zone under own responsibility, B186, 2nd floor)
  - LHCb ca. 50 m2

Cleanroom classification

find compromise between cost, noise, discipline ←→ risk of detector or equipment failure due to dust.

Divide zone up into 3 sub-zones:

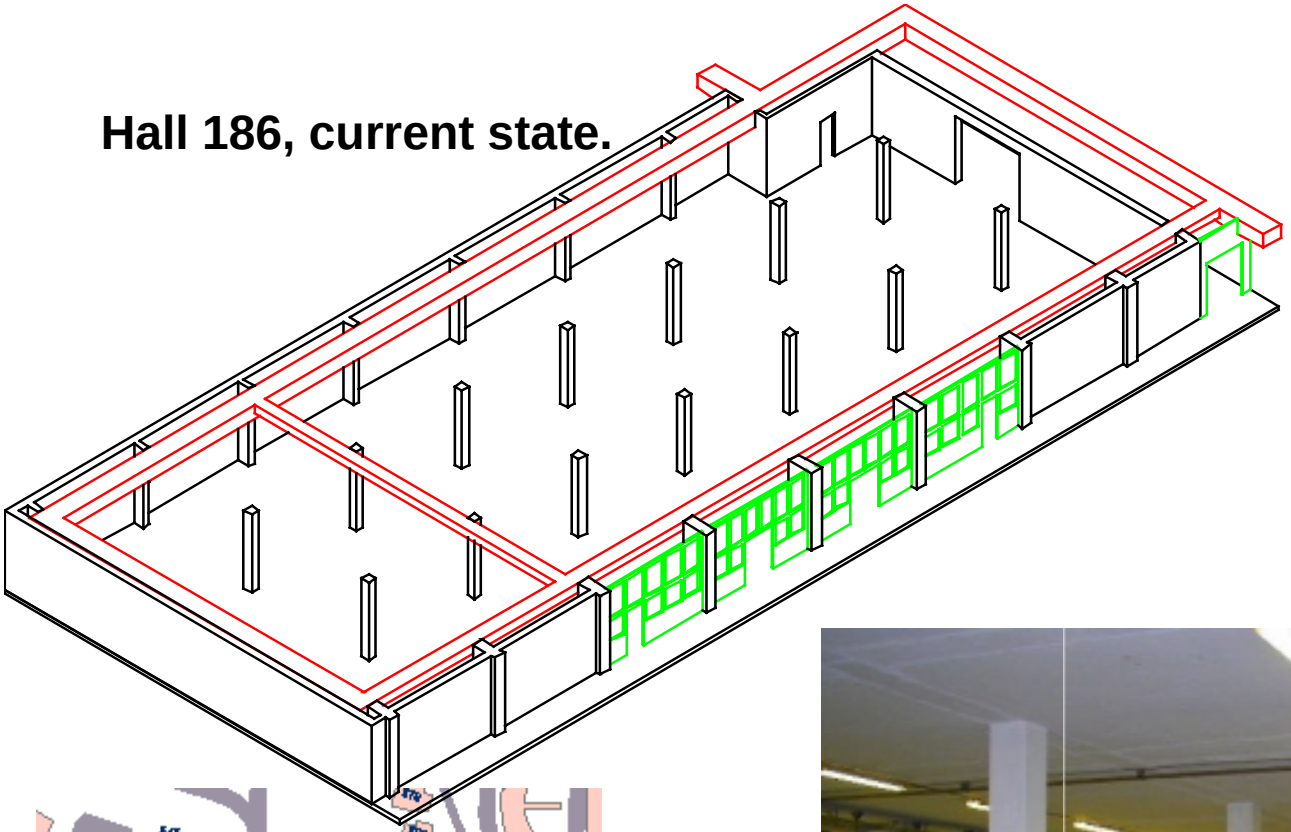
- bonding lab (SSDBL) <100.000 (zone A)
- clean zone ≈ 100.000 (zone B)
- less clean zone > 100.000 (zone C)

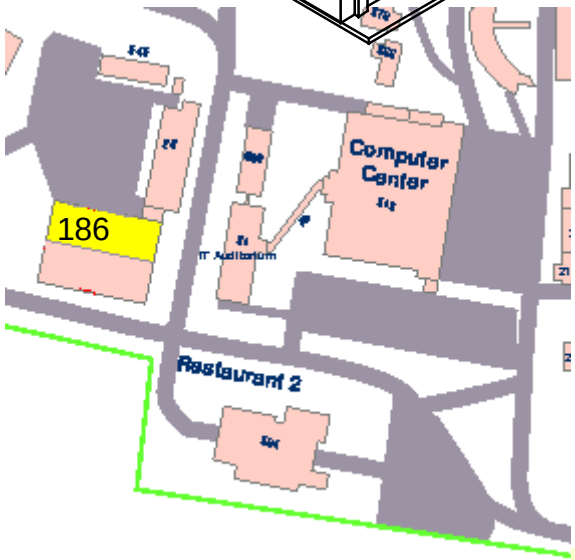
Temperature and humidity control

T ≈ 21 ± 1ºC , H ≈ 45 ± 5%

Hall 186, current state.

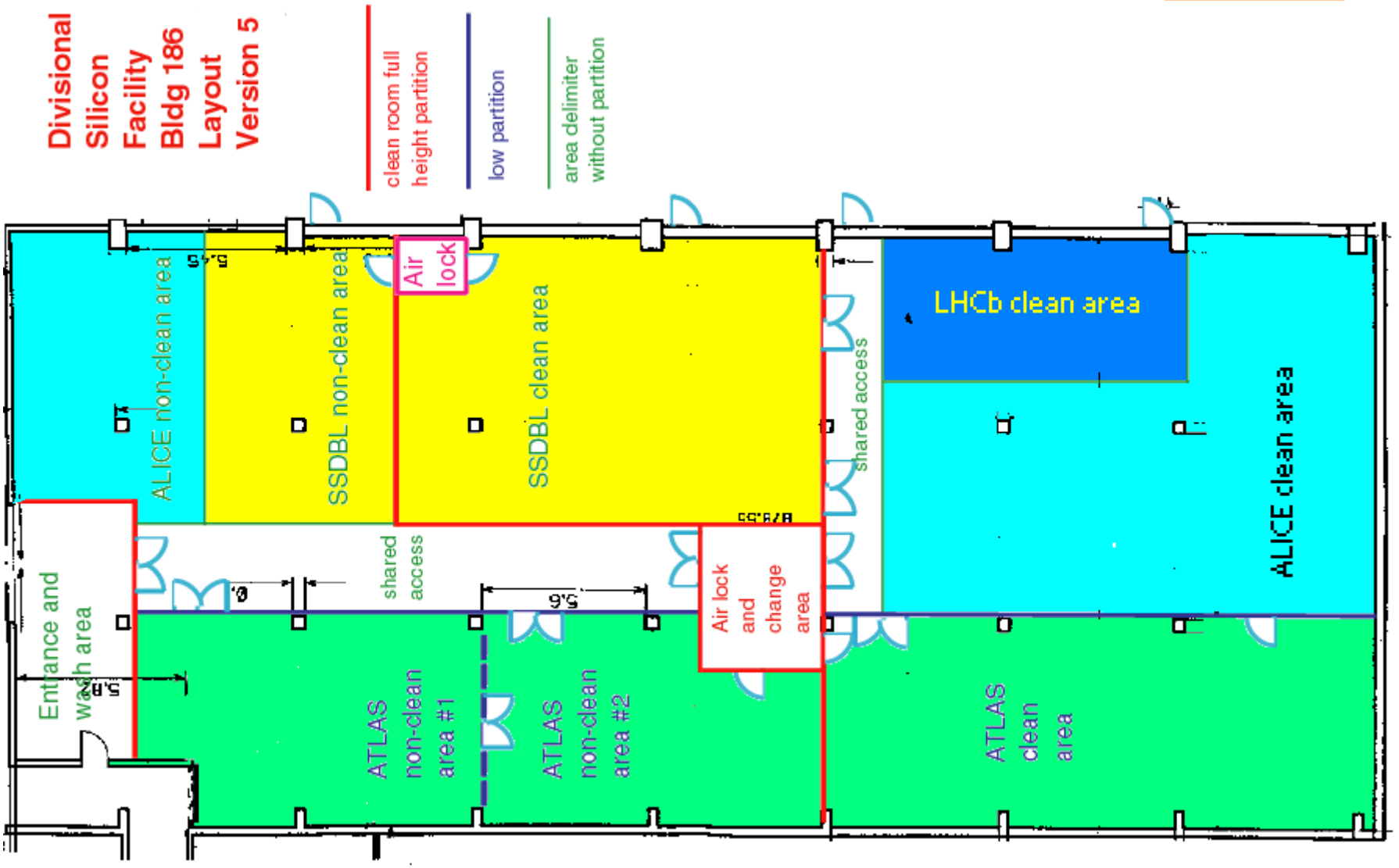
Divisional Silicon Facility





Agreed sharing of area: SSDBL / ATLAS / ALICE / LHCb (CMS uses upper floor of B 186)

Divisional Silicon Facility



Basic infrastructure

- New electricity network
- New lighting
- Structured telephone and ethernet
- Gas supplies (N_2, Ar, CO_2, comp. air)
- Cooling water, vacuum distribution lines
- Special floor (antistatic) and wall painting (washable)
- Air locks between non-clean and clean zones
- False ceiling in zones A and B.

Current Status

- Performed a conceptual study of air treatment
- Technical discussions and price estimates for all subprojects

$\Sigma \approx 1$ MCHF

Discussions with division and LHC experiments on financing promising.

Project planning

- market surveys out: this week
- calls for tender out: August 2001
- deadline to tenders: October 2001
- award of contracts: November 2001
- start of works: December 2001
- start of operation March/April 2002

Cooling / ventilation handled by ST/CV