

Results from TIB Module

INFN Pisa

- **FR4 Hybrid: very good**
 - no bad channels
- **2 x CSEM Sensors: very good**
 - 1 (not so) bad channel $R_{poly} = 0.94 \text{ M?}$
- **Module Test**
 - CMS like / Lyon System
 - Try to follow Express Line Procedures

Strip numbering

Module TIB_001

Sensor
strip
number

APV address

Strip ?512

Strip ?1



X25 (74)

X24 (72)

X21 (66)

X20 (64)

List of tests

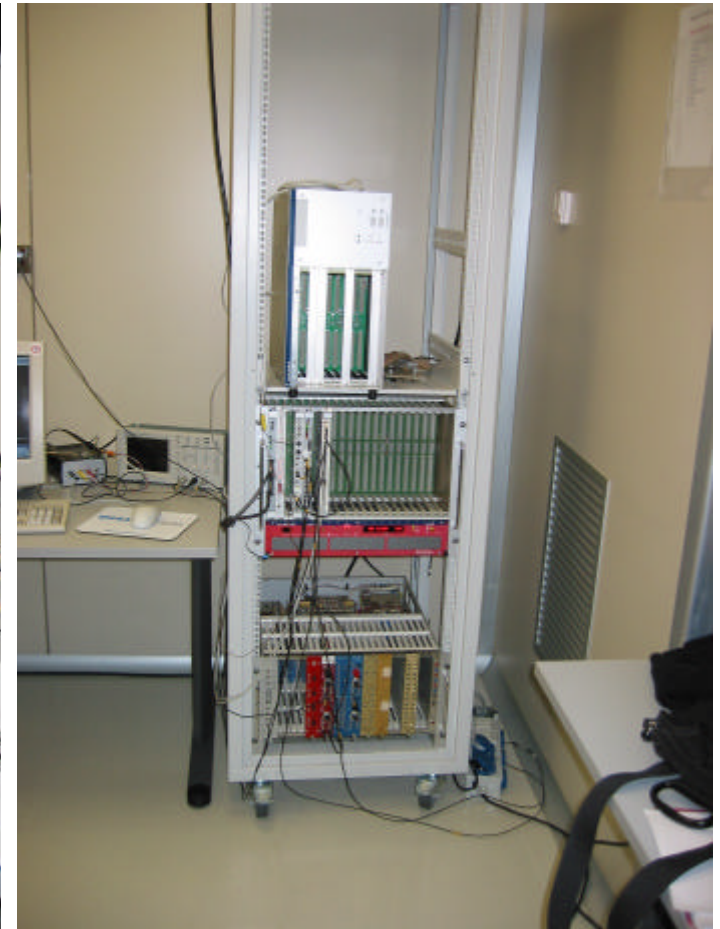
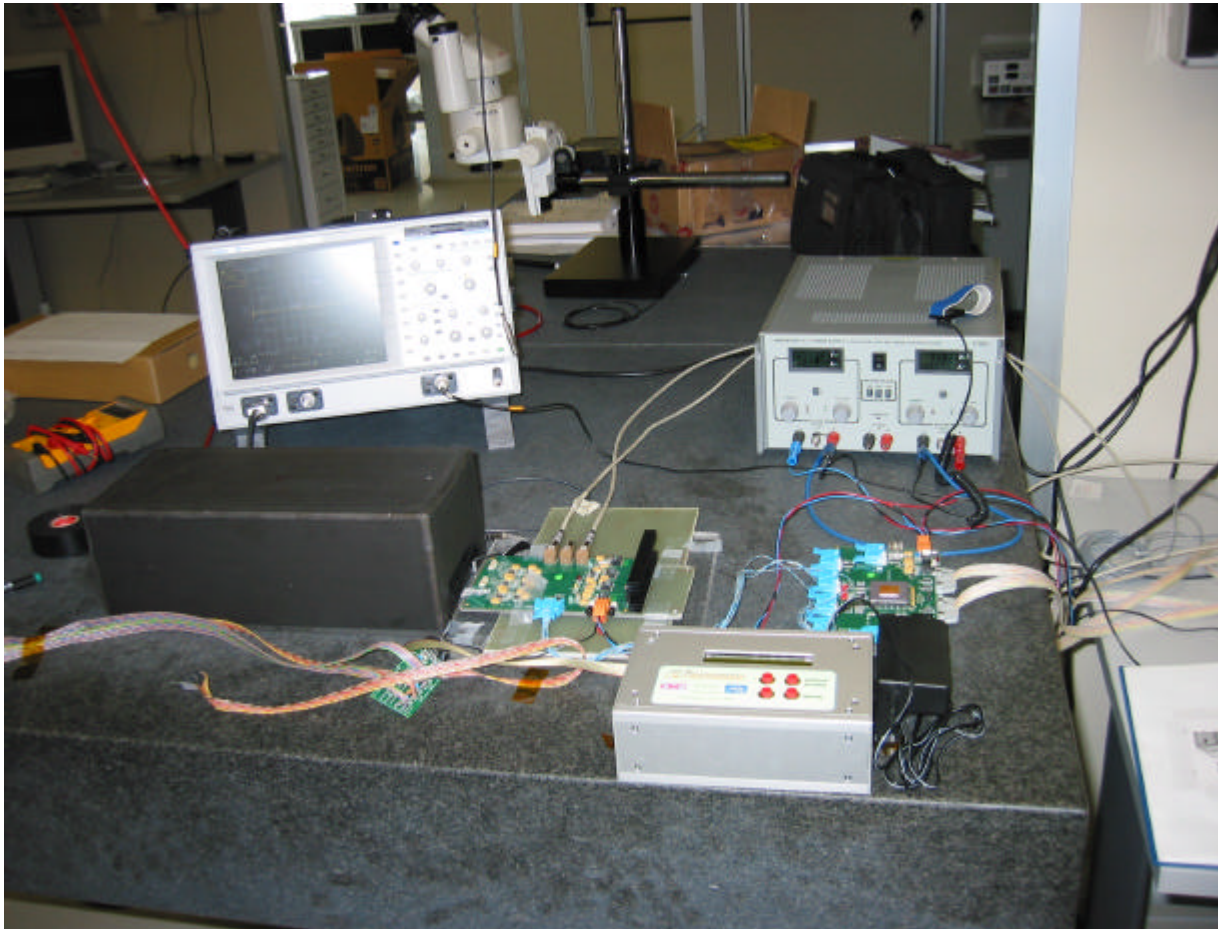
in red: test performed

- **IV test** (up to V_{max})
- **Basic test** (core test for hybrid and module)
 - **H0-test** (APVMUX, APV25, DCU, PLL)
 - **F-test** (pedestal and noise)
 - **C-test** (calibration at 1 MIP)
- **B-test** (backplane pulsing)
- **L-test** (test with Led or Laser)
- **Pipe-test** (latency scan)
- **Psh-test** (calibration pulse)
- **PLL test** (fine delay scan)

CMS/Lyon test setup

- **Hardware**
 - **VME based system (TTCvi, TTCvx, Seqsi)**
 - **UTRI card**
- **Software**
 - **Client from Lyon: rel. November 2001**
- **APV25 Parameters**
 - **From nominal settings as reported in the User Guide ver.2.2, sec.6.2, page 17**

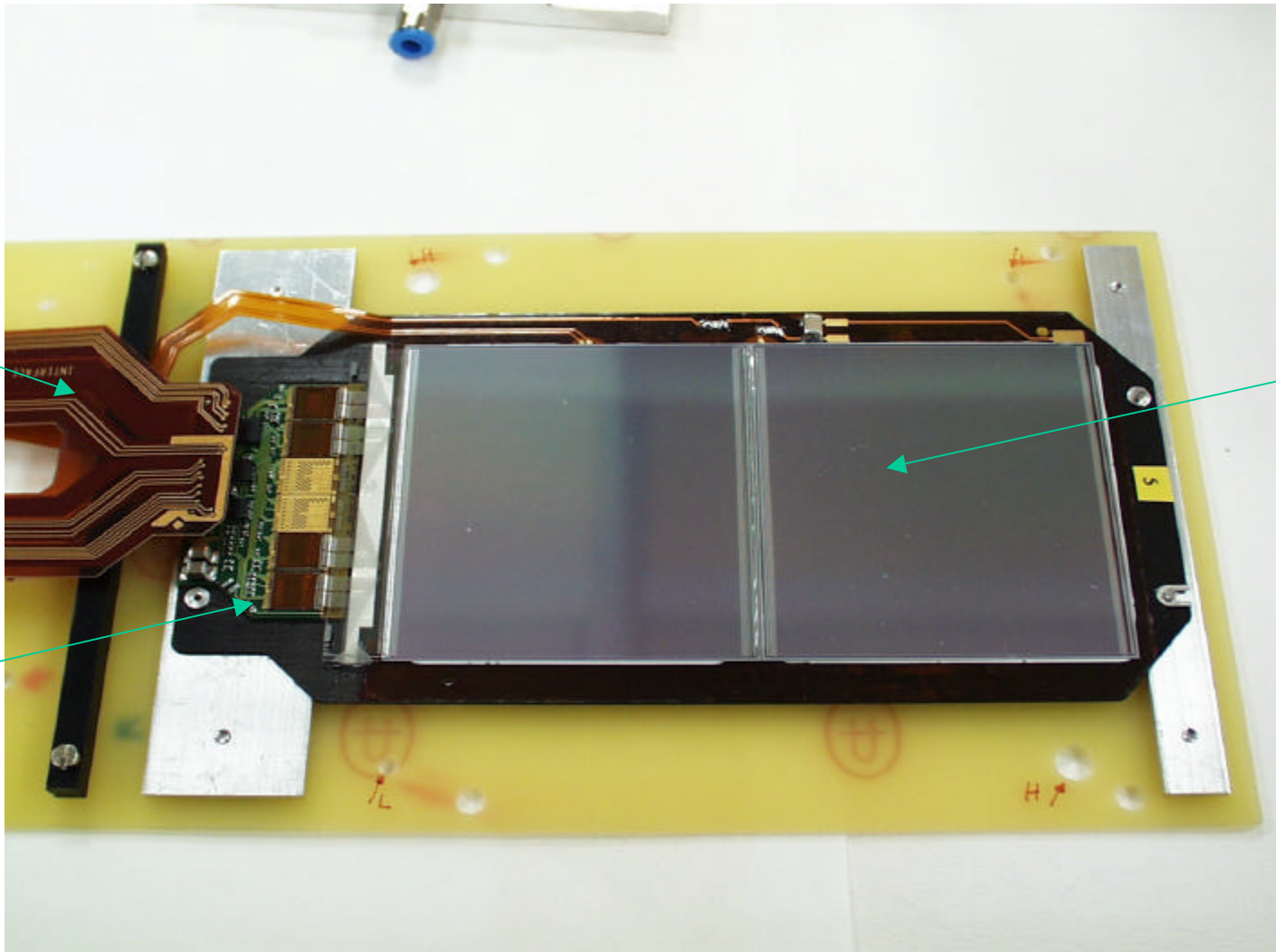
CMS/Lyon test setup



Module PG_TIB_001

**Kapton
Y cable**

**FR4
Hybrid**



**CSEM
sensors**

IV test

- **CAEN SY527 Power Supply**
 - Current limit 5 ? A
- **Rump up of 10 V/s**
- **I < 2 ? A during rump up**
- **But first time: very slow rump up due to high current and instability**
- **$I_{\text{module}} = I_{\text{sensor1}} + I_{\text{sensor2}} = 0.6 ? \text{ A}$ (T = 26°C)**
- **Vmax = 500 V (Vbreak > 550 V)**

F-test: Noise in Peak mode

Title:

Creator:

ROOT Version3.01/06

Preview:

This EPS picture was not saved
with a preview included in it.

Comment:

This EPS picture will print to a
PostScript printer, but not to
other types of printers.

Psh-test: Peak mode

Title:

Creator:

ROOT Version3.01/06

Preview:

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with a preview included in it.

Comment:

This EPS picture will print to a
PostScript printer, but not to
other types of printers.

Strip #394



Psh-test: Deconvolution mode

Title:

Creator:

ROOT Version3.01/06

Preview:

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with a preview included in it.

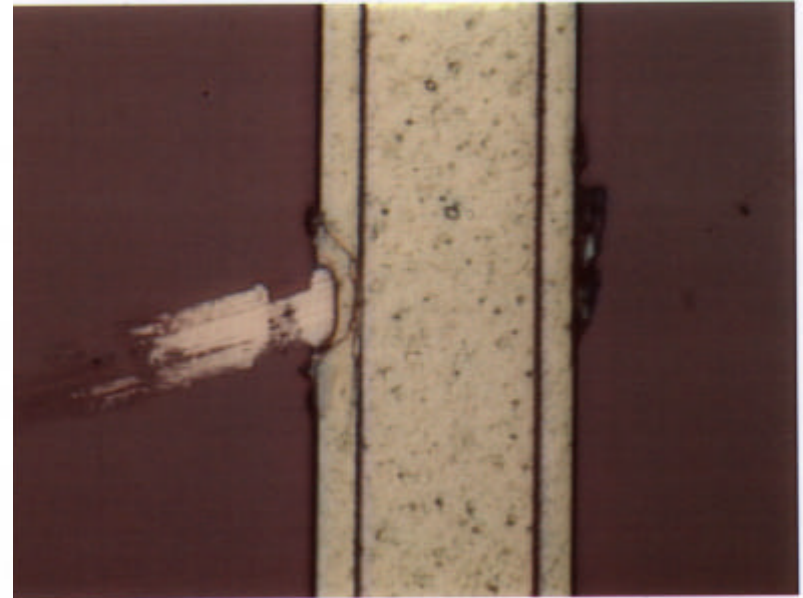
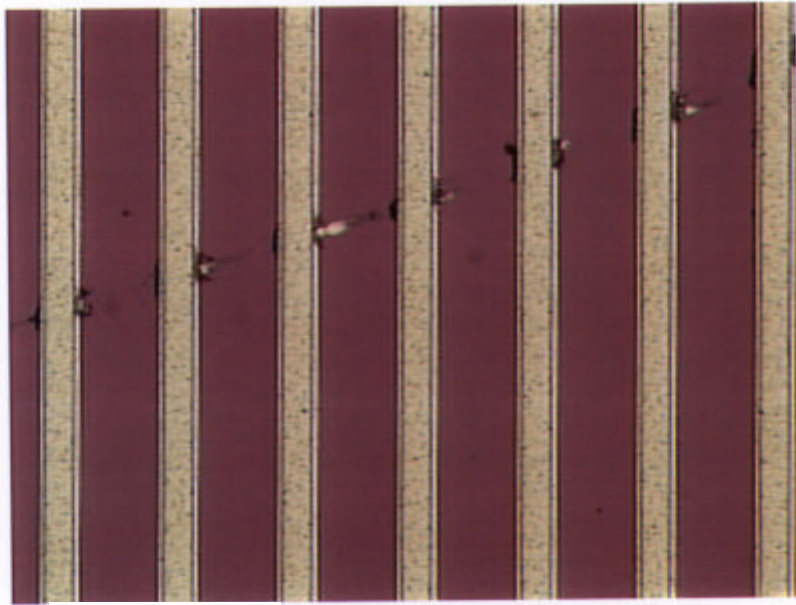
Comment:

This EPS picture will print to a
PostScript printer, but not to
other types of printers.

F-test and Psh-test

- **Before bonding all strips were good**
- **After bonding**
 - **Noisy channels: Strip #1, #2, #512**
 - **Dead channels: Strip #394**
 - **Visual inspection does not show any damage due to bonding procedure**
 - **Possible correlation with aluminium etching**

Sensor #30210100518



↑
Strip
#394

Report file

- **Following the Procedures for Express Line**
- **File Header:**

Hybr/Mod	Module_ID	Center_ID	Setup_type	Date	I_100(uA)	I_500(uA)
M_TIB	PG_TIB_001	Pisa	CMS	20022002	0.3	0.6

- **Mean values and RMS extracted from ROOT files**
- **Calibration with 2.75 MIP (ICAL = 80)**

APV1

meanpedpk	pedrmspk	pedmeansdec	pedrmsdec
186.3	4.0	173.6	3.5
sigmeanpk	sigrmspk	sigmeandec	sigrmsdec
1.3	0.2	1.8	0.2
calmeanpk	calrmspk	calmeandec	calrmsdec
88.0	0.9	74.8	0.9

Conclusions

- **First TIB module (milestone 200) tested in Pisa**
- **IV measurement needs some care**
- **Few noisy strips at the module edges**
- **Only 1 dead channel found after bonding (0.2%)**
- **Report file filled using **root** macros**
- **All informations and plots collected on the web:**
<http://cms.pi.infn.it:8088/Si/m200/index.html>

Future work

- Test the next Hybrid with **ARC system**
- Include the **TSC** card in **Lyon/CMS system**
- Implement the missing tests (laser, backplane pulse,...)
- Automate the IV measurement
- Waiting for a database: improve the information collected in the web page
 - Report file from bonding procedure