TIB modules test results from Bari

(D. Giordano - S. My)

- Optical Inspection System
- Hybrid Test (ARC-System) before Assem.
- Module Assembling
- Hybrid Test (ARC-System) after Assem.
- Bonding
- Module Test (CMS-like System)
Test results for:

<table>
<thead>
<tr>
<th>TIB009</th>
<th>TIB010</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 2 CSEM Sensors (daisy chained)</td>
<td>• 2 CSEM Sensors (daisy chained)</td>
</tr>
<tr>
<td>• Ceramic Hybrid (4 APVs)</td>
<td>• Fr4_v1 Hybrid (4 APVs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fr4_v2 Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 APVs (Only 4 connected to PA)</td>
</tr>
<tr>
<td>(preliminary results)</td>
</tr>
</tbody>
</table>
Optical Inspection System
ARC System Setup

LV-Source (+5 V, -5V)

Automated Fast Test
- Self Test ARC System
- Low Voltage Control
- I2C Address Scan & APV R/W Cycles
- APV Data Output & Clock Distribution
- Mux Resistors Check

Noise, Pedestal & Calibration

APV Settings

- IPRE 98
- IPCASC 52
- IPSF 34
- ISHA 34
- ISSF 34
- IPSP 55
- IMUXIN 34
- ICAL 29
- VFP 30
- VFS 60
- VPSP 40

Domenico Giordano

CMS-week June 2002
Ceramic hybrid Noise

Incoming

After Assembling

After Bonding

Peak

Dec

PA structure?

Missing bonding:
143,172,178,226,227

no HV
Ceramic Calibration Psh

APV2 After Bonding (no HV)

Peak

Dec

missing bonding: 143, 172, 178, 226, 227
Fr4_v1 hybrid Noise

Incoming

After Assembling

After Bonding

Peak

Dec

No HV

Domenico Giordano

CMS-week       June 2002
Fr4_v2 hybrid (Version 2)
(Peak mode)

Incoming
After Assembling
After Bonding

Pedestal
Noise
no HV

APVs not-connected
**CMS-like System Setup**

Lyon DAQ with TSC

analysis tool: Torino macro

<table>
<thead>
<tr>
<th><strong>TIB009</strong></th>
<th>Depletion Voltage: 220 V</th>
<th>Bias: 300 V</th>
<th>I ~8 μA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TIB010</strong></td>
<td>Depletion Voltage: 200 V</td>
<td>Bias: 300 V</td>
<td>I ~13 μA</td>
</tr>
</tbody>
</table>

Domenico Giordano

CMS-week

June 2002
TIB009 Noise
(after CMN subtraction)

Peak

APV1
mean: 1.32
rms: 0.16

APV2
mean: 1.3
rms: 0.1

APV3
mean: 1.33
rms: 0.06

APV4
mean: 1.31
rms: 0.12
TIB009 Noise
(after CMN subtraction)

Dec

- APV1
  mean: 1.61
  rms: 0.18

- APV2
  mean: 1.72
  rms: 0.33

- APV3
  mean: 1.68
  rms: 0.06

- APV4
  mean: 1.60
  rms: 0.47
**Number of bad strips 16:**

<table>
<thead>
<tr>
<th>Chip</th>
<th>Strip</th>
<th>Peak Condition</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Raw Noise + Noise;</td>
<td>Raw Noise + Noise</td>
</tr>
<tr>
<td>1</td>
<td>21</td>
<td>OK;</td>
<td>Calibration</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
<td>Raw Noise + Noise + Cal;</td>
<td>as peak</td>
</tr>
<tr>
<td>1</td>
<td>128</td>
<td>OK;</td>
<td>Raw Noise</td>
</tr>
<tr>
<td>2</td>
<td>129</td>
<td>Raw Noise + Noise + Cal;</td>
<td>Raw Noise + Noise + Cal</td>
</tr>
<tr>
<td>2</td>
<td>144</td>
<td>OK;</td>
<td>Calibration</td>
</tr>
<tr>
<td>2</td>
<td>173</td>
<td>OK;</td>
<td>Calibration</td>
</tr>
<tr>
<td>2</td>
<td>179</td>
<td>OK;</td>
<td>Calibration</td>
</tr>
<tr>
<td>2</td>
<td>227</td>
<td>Raw Noise;</td>
<td>Calibration</td>
</tr>
<tr>
<td>2</td>
<td>228</td>
<td>OK;</td>
<td>Calibration</td>
</tr>
<tr>
<td>2</td>
<td>256</td>
<td>Raw Noise;</td>
<td>Raw Noise + Noise</td>
</tr>
<tr>
<td>3</td>
<td>319</td>
<td>Raw Noise + Noise;</td>
<td>OK</td>
</tr>
<tr>
<td>3</td>
<td>384</td>
<td>OK;</td>
<td>Raw Noise</td>
</tr>
<tr>
<td>4</td>
<td>480</td>
<td>OK;</td>
<td>Raw Noise</td>
</tr>
<tr>
<td>4</td>
<td>511</td>
<td>OK;</td>
<td>Raw Noise</td>
</tr>
<tr>
<td>4</td>
<td>512</td>
<td>Raw Noise + Noise;</td>
<td>Raw Noise + Noise</td>
</tr>
</tbody>
</table>

*Cut methods:*
- Cuts in chip average value percentage
- Pedestal: low 0.10 high 0.10
- Noise: low 0.20 high 0.20
- RNoise: low 0.20 high 0.20
- Calibration: low 0.20 high 0.10

*unbonded strips on APV2*
TIB010 Noise
(after CMN subtraction)

Peak

APV1
mean: 1.38
rms: 0.15

APV2
mean: 1.40
rms: 0.15

APV3
mean: 1.40
rms: 0.05

APV4
mean: 1.42
rms: 0.28
TIB010 Noise
(after CMN subtraction)

Dec

APV1
mean: 1.79
rms: 0.36

APV2
mean: 1.84
rms: 0.28

APV3
mean: 1.79
rms: 0.06

APV4
mean: 1.82
rms: 0.49
TIB010 Bad Strips

Number of bad strips 8:

<table>
<thead>
<tr>
<th>Chip</th>
<th>Strip</th>
<th>Peak Action</th>
<th>Dec Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Raw Noise + Noise;</td>
<td>Raw Noise + Noise</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>OK;</td>
<td>Raw Noise + Noise</td>
</tr>
<tr>
<td>1</td>
<td>21</td>
<td>Raw Noise + Noise;</td>
<td>OK</td>
</tr>
<tr>
<td>1</td>
<td>81</td>
<td>Noise;</td>
<td>OK</td>
</tr>
<tr>
<td>2</td>
<td>256</td>
<td>Raw Noise + Noise;</td>
<td>Raw Noise + Noise</td>
</tr>
<tr>
<td>2</td>
<td>257</td>
<td>OK;</td>
<td>Raw Noise</td>
</tr>
<tr>
<td>4</td>
<td>511</td>
<td>OK;</td>
<td>Raw Noise + Noise</td>
</tr>
<tr>
<td>4</td>
<td>512</td>
<td>Raw Noise + Noise;</td>
<td>Raw Noise + Noise</td>
</tr>
</tbody>
</table>

**Cut methods:**
cuts in chip average value percentage

- **Pedestal:** low 0.10 high 0.10
- **Noise:** low 0.20 high 0.20
- **RNoise:** low 0.20 high 0.20
- **Calibration:** low 0.20 high 0.10
Antwerpen’s Sw

- installed last week
- module test foreseen next week

Next Step:
implement temperature and humidity sensors (Wien TRHX)