WP Testbeam and DAQ

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• WP 3.1 work package management

• WP 3.2 Existing telescope upgrade (EOI-21, 32 & 141)
  • 3.2.1 new sensors: We plan to use an already available or close to available sensor for the first round of telescope upgrades. It has to offer comparable performance to the MIMOSA26 sensors currently in use. A market survey will be the first milestone of this task.

  See Table on the next slide

  If there is a suitable sensor developed in the CMOS WP, this could be used for a second upgrade stage.

• 3.2.2 Common cold box: (EOI-20)

  A common cold box is strongly requested by various user groups, particularly with common interfaces, so it can be used at all telescope sites.
## Sensor Comparison

<table>
<thead>
<tr>
<th></th>
<th>MIMOSA26</th>
<th>ALPIDE</th>
<th>MIMOSIS (CBM)</th>
<th>MALTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>AMS350</td>
<td>TowerJazz180</td>
<td>TowerJazz180</td>
<td>TowerJazz180</td>
</tr>
<tr>
<td>Sensor Size (cm)</td>
<td>2 x 1 cm</td>
<td>3 x 1.5</td>
<td>3.1 x 1.35</td>
<td>1.8 x 1.8</td>
</tr>
<tr>
<td>Pixel Pitch (µm)</td>
<td>18 x 18</td>
<td>26.88 x 29.24</td>
<td>26.88 x 30.24</td>
<td>36.4 x 36.4</td>
</tr>
<tr>
<td>Resolution (d/√12)</td>
<td>5.2</td>
<td>7.8 x 8.4</td>
<td>7.8 x 8.7</td>
<td>10.5</td>
</tr>
<tr>
<td>Thickness (µm)</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>100 (50 possible)</td>
</tr>
<tr>
<td>Hit Time resolution</td>
<td>112.5 µs</td>
<td>5 ~ 10 µs</td>
<td>5 µs</td>
<td>&lt; 10 ns</td>
</tr>
<tr>
<td>Readout time</td>
<td>112.5us per frame</td>
<td>Zero suppressed, By 1200Mb/s data link.</td>
<td>2 Gbit/s link</td>
<td>hit rates up to 10MHz/cm²</td>
</tr>
<tr>
<td>Availability</td>
<td>Legacy</td>
<td>ALICE mass production</td>
<td>Q42020 for users</td>
<td>prototype</td>
</tr>
</tbody>
</table>
• WP 3.3 Sub-ns timing
  To provide a $O(100)$ ps timing for particle hits, a dedicated timing layer as well as a TLU with ps timing support need to be developed, integrated and installed at CERN and DESY.
  • 3.3.1 Timepix4 support:
  • 3.3.2 Timing support in the TLU:

• WP 3.4 DAQ software for future test beams: (EOI-19, 21, 22, 23, making use of EOI 28 from computing)
  The development and roll-out of EUDAQ2 was a great success in AIDA2020. The next generation of sensors for the telescopes and future test beam needs will require further enhancements of the software framework, e.g. multi-sensor operation, timing support and a more versatile online monitoring.
  • EUDAQ2 support for ps timing and next generation sensors
  • Versatile Online Monitoring for EUDAQ2

• WP 3.5 Common Hardware (EOI-15, 55, 98, 127), if funding permits.
  • Common boards and associated software and documentation
Potential Industrial partners

ANS Industrial (supplier)
Amsterdam Scientific Instruments (ASI)
SRS Technology (CERN spinoff)
Picotech SAS
PETsys electronics