(Existing) Component irradiation brainstorming

Aims?

Devices to test?

What irradiation facilities to use?

What/how to measure?

Timescales?
(Existing) Component irradiation brainstorming

Aims?

Validate/compare components to SLHC fluences and doses
Catalogue and (try to) understand radiation effects
Evolve test procedures
(Existing) Component irradiation brainstorming

Devices to test?

All front-end, plus cables, connectors that are exposed to radiation

Lasers
Photodiodes
Fibre-optics

‘full’ links

Electronics
Hybrids
SMDs
Connectors

(share with other system parts testing.....)

plus any other related parts:
Glues
Plastics
(Existing) Component irradiation brainstorming

What irradiation facilities to use?

<table>
<thead>
<tr>
<th></th>
<th>$\gamma$(^{(60\text{Co, X)}})</th>
<th>n</th>
<th>p (or $\pi$)</th>
<th>lons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dose</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>displacement</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEE</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
(Existing) Component irradiation brainstorming

Timescales?

similar to LHC development cycle?

2005-6 first tests
  high fluence
  high dose

aim to:
  find potential ‘showstoppers’
  develop procedures

2006 onwards (N years, N?)

more systematic tests
- in this current generation, there was time to make systematic tests
‘system’ tests

materials testing
(Existing) Component irradiation brainstorming

Aims?
- Validate/compare components to SLHC fluences and doses
- Catalogue and (try to) understand radiation effects
- Evolve test procedures

Devices to test?
- All front-end, plus cables, connectors exposed
- Lasers, photodiodes, fibre-optics, electronics, hybrids, SMDs, connectors
- Plus any other related parts: (glues, plastics)

What irradiation facilities to use?

What/how to measure?
- In-situ vs before/after?
- Characteristics to measure?
- Fluences and doses?
- Test final operating condition?
- Materials issues?
  - Packaging
  - Plastics

<table>
<thead>
<tr>
<th></th>
<th>γ (^{60}\text{Co}, \text{X})</th>
<th>n</th>
<th>p ((\pi))</th>
<th>Ions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dose</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SEE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Timescales?
- Identify showstoppers (1-2 yrs)
- Systematic tests (several years)