

Dear all,

Many of you are aware of the activities at CERN on CMS with regard to optical links. The CERN team includes about 10 people, led by Francois Vasey, working for more than 10 years now on these projects.

(a) Present activities

We are currently delivering optical links for readout of the Tracker (40k links, analogue, 40Msamples/s at 8bit resolution), digital control links (7k links, 80Mbit/s, bidirectional) and are involved in ECAL readout (11k links, 1Gbit/s), and are coordinating (resp. Jan Troska) the TTC system for CMS.

We collaborate with Univ. Minnesota on ECAL links, and Univ. Vienna (Hephi) and INFN Perugia on the Tracker readout optohybrids.

These systems involve about 10 contracts/orders with external suppliers, managed by CERN.

All parts in the experiment have been qualified, mainly by the CERN team, to be sufficiently rad-resistant and reliable. The philosophy has been to work as close as possible with commercially available off-the-shelf parts and to share parts between the 3 systems. In reality this means that the analogue link parts have been re-used where possible in the other smaller systems (not including TTC).

(b) Future

The CERN team is expected to start by studying the optical links requirements and eventually define the specs for upgrades to these transmission systems, and to work on the integration of the upgraded Tracker into the 1st level trigger.

In parallel we will build/test proto-systems (using standard existing and new parts as well as some custom parts, e.g. ASICs) and gather experience on optical links with speeds up to 10Gbit/s.

Radiation testing of parts has started, e.g. neutron fluences up to  $10^{16}$  n/cm<sup>2</sup> and will continue for the foreseeable future eventually on the full range of parts. We typically make a mix of neutron (Louvain la Neuve, BE), gamma (SCK-CEN, BE and Ionisos, FR) and pions (PSI) to cover the likely accumulated exposure effects., plus SEE tests (e.g. at Louvain again).

These tests are backed up with lab studies of environmental effects: accelerated ageing, mechanical/thermal reliability, thermal resistance (laser junction temperature), magnetic field; as well as and functionality: S/N, bandwidth, both at level of component and system performance.

This work is undergoing a (natural) slow start because of our present commitments and we would be happy to collaborate with ATLAS on the future projects wherever we share common ground.

cheers,

Karl