



EUROPE

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RESEARCH



SC00000701

CERN/DRDC/91-42

DRDC/S31

October 9, 1991

SEP
CERN-DRDC
91-42

SUMMARY

Optoelectronic Analogue Signal Transfer for LHC Detectors

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Abstract

We propose to study and develop opto-electronic analogue front-ends based on *electro-optic intensity modulators*. These devices translate the detector electrical analogue signals into optical signals which are then transferred via *optical fibres* to photodetector receivers at the remote readout. In comparison with conventional solutions based on copper cables, this technique offers the advantages of high speed, very low power dissipation and transmission losses, compactness and immunity to electromagnetic interference. The linearity and dynamic range that can be obtained are more than adequate for central tracking detectors, and the proposed devices have considerable radiation-hardness capabilities. The large bandwidth and short transit times offer possibilities for improved triggering schemes.

The proposed R&D programme is aimed at producing multi-channel "demonstrator" units for evaluation both in laboratory and beam tests. This will allow the choice of the most effective technology. A detailed study will also be carried out on packaging and interconnection to large arrays of fibres, as well as on the optimization of the processes for the production of large quantities.