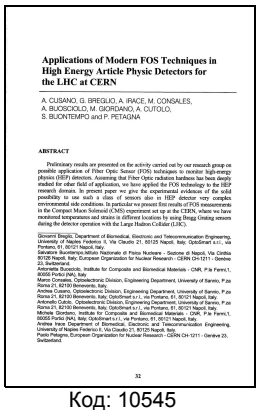

Applications of Modern FOS Techniques in High Energy Article Physic Detectors for the LHC at CERN

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ABSTRACT

Preliminary results are presented on the activity carried out by our research group on possible application of Fiber Optic Sensor (FOS) techniques to monitor high-energy physics (HEP) detectors. Assuming that Fiber Optic radiation hardness has been deeply studied for other field of application, we have applied the FOS technology to the HEP research domain. In present paper we give the experimental evidences of the solid possibility to use such a class of sensors also in HEP detector very complex environmental side conditions. In particular we present first results of FOS measurements in the Compact Muon Solenoid (CMS) experiment set up at the CERN, where we have monitored temperatures and strains in different locations by using Bragg Grating sensors during the detector operation with the Large Hadron Collider (LHC).

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On specific request of HEP detector experts we have also started the development of a new class of Relative Humidity (RH) sensor based on Fiber Optic technology, able to perform the monitoring of RH at low temperature, aiming to probe the dew point value with few degree precision. Preliminary results are very encouraging, letting us consider the use of FOS technique as a robust and effective solution for monitoring requirements in HEP detectors for physical and environmental parameters.

Ключевые слова:

Содержание.