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Radiation Monitoring of the GEM Muon Detectors at CMS

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The higher energy and luminosity of future High Luminosity (HL) LHC, determines a significant increasing of the radiation background around the CMS subdetectors, and especially in the higher pseudorapidity region. Under such heavy conditions, the RPC (used in muon trigger) most probably could not operate effectively. A possible better solution is the so-called GEM (Gas Electron Multiplier) detector, whose tests at the CMS will be realized in near future.

A monitoring system to control the absorbed radiation dose by the GEM under test is developed. Two types of sensors are used in it: RadFETs for total absorbed dose and p-i-n diodes for particle (proton and neutron) detection. The basic detector unit, called RADMON, contains two sensors of each type and can be installed at each GEM detector. The system has a modular structure, permitting to increase easily the number of controlled RADMONs: one module controls up to 12 RADMONs, organized in three groups of four and communicates with the control system using RS485 and/or CANBUS interfaces.

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