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The upgrade of the RPC-based ALICE Muon Trigger

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The muon trigger of the ALICE experiment is currently yielded by 72 Bakelite single-gap Resistive Plate Chambers operated in maxi-avalanche mode (low threshold value, without amplification in the FE electronics), arranged in four 5.5x6.5 m2 detection planes. In order to meet the requirements posed by the forthcoming LHC high luminosity runs from 2020 onwards, in which ALICE will be read out in continuous mode, the Muon Trigger (renamed as Muon IDentifier in the framework of this upgrade) will undergo a major upgrade. In the current setup, signals from 21k strips are discriminated by 2400 non-amplified Front End (FEE) cards, whose thresholds are provided by external reference voltages (one for each chamber side). All these cards will be replaced with discriminators equipped with a pre-amplification stage, so called FEERIC cards, which will allow a reduction in the operating HV of the detectors, thus prolonging their lifetime. Furthermore, the FEERIC thresholds will be set via I2C using wireless allowing the tuning of the values at the single card level , if ongoing validation tests are satisfactory. Moreover, the 24 most exposed RPC chambers will be replaced with new ones, equipped with high-quality (i.e. smoother surface) Bakelite laminates. The tests performed on the FEERIC cards, used both in a test bench and on detectors, and on the new RPC chambers (with cosmic rays) will be reported.

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