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GEM Detectors for Muon Tomography of Nuclear Contraband
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nology — The construction of a Muon Tomography station is presented. Muon
Tomography (MT), based on scattering of cosmic ray muons, is an improvement to
actual portal monitors at borders, since the current techniques use regular radia-
tion detection that are not very sensitive to nuclear contraband (U, Pu), if these
materials are well shielded to absorb emanating radiation. We use a low mass, high
spatial resolution ($\sim 50 \mu\text{m}$) Gas Electron Multiplier (GEM) detectors for MT to
overcome the intrinsic limitations. The prototype MT station employs 6 tracking
stations based on 33cm x 33cm triple-GEM detectors with 2D readout. The de-
tectors are arranged into tracking superlayers at the top and bottom of the probed
volume. Due to the excellent spatial resolution of GEM, it is sufficient to use few
cm gap between tracking stations. We present details of the production and assem-
bly of the GEM-based tracking stations in collaboration with CERN-GDD lab and
RD51 experiment as well as the design of the corresponding front-end electronics
and readout system. Discussion about GEM detectors in two sides of the probed
volume for a complete muon tracking, and large-area (1m x 1m) GEM-based MT
station prototype to be tested under realistic conditions, are made.

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