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Micromegas for CLAS12 experiment at Jefferson Laboratory

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The electron accelerator of the Thomas Jefferson Laboratory (Virginia, USA) will soon be upgraded to deliver 12 GeV high intensity beams. This increase of performance will give the opportunity to study the nucleon structure with an unprecedented accuracy. To meet this end, new equipments will be installed in the experimental areas, particularly in the Hall B/CLAS spectrometer. One of the most challenging aspects is the installation of a Central Tracker surrounding the target, dedicated to the detection of particles emitted at large angles. Micromegas detectors have been chosen to be a major element of this new equipment, due to their high rate capability as well as their robustness and light material. Using the recent bulk technology, part of these gaseous detectors are planned to be assembled in thin cylinders to maximize the acceptance. On the other hand, the presence of a strong magnetic field either perpendicular or parallel to the readout strips has important consequences which need to be carefully investigated. Finally, hybrid technologies like Micromegas-GEM or resistive layers have also been studied to further improve the rate capability. The R&D carried out and the status of this project, which could benefit to future high luminosity experiments, will be presented.

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