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GEM detectors for the MAGIX focal plane: minimising materials for low energy experiments

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The new MAGIX experiment, to be built at the 105 MeV line of the ERL MESA at the institute for Nuclear Physics of the University of Mainz, features two high-resolution spectrometers looking at the target area where luminosity of the order of $10^{35} \text{cm}^{-2} \text{s}^{-1}$ will be achievable. To improve the momentum and angular resolution of the spectrometers, the greatest challenge is to minimise the material budget of their GEM-based focal plane detectors as much as possible.

In this talk we will present the solutions we developed to build a high-resolution MPGD tracker for those experimental conditions including a foil based readout plane with Chromium-GEM amplification and a short-drift TPC with an open field cage, the latter being the solution finally approved for the experiment.

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