

Characterization of Charge Spreading and Gain of Encapsulated Resistive Micromegas Detectors for the Upgrade of the T2K Near Detector Time Projection Chambers

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The near detector of T2K experiment is undergoing a major upgrade. A new Time Projection Chambers have been constructed, based on the innovative resistive Micromegas technology. A resistive layer is deposited onto the segmented anode in order to spread the charge onto several adjacent pads. This way, the spatial resolution for a given segmentation is improved. The results of the first detailed characterization of the charge spreading in resistive Micromegas detectors will be presented. A detailed physical model has been developed to describe the charge dispersion phenomena in the resistive Micromegas anode. The detailed physical description includes initial ionization, electron drift, diffusion effects and the readout electronics effects, including description and simulation of noise. The model provides an excellent characterization of the charge spreading of the experimental measurements and allowed the simultaneous extraction of gain and RC information of the modules.

Alternate track

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