

## Studying Track Distortions From the Space Charge Effect at MicroBooNE

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### Content

I present a study of the distortions on track reconstruction caused by the space charge effect within the MicroBooNE Liquid Argon Time Projection Chamber (LArTPC). The space charge effect is the accumulation of slow-moving positive ions in a detector primarily from ionization by cosmic ray muons. Spatial and temporal distortions of ionization electrons result from this effect in addition to differences in the magnitude of charge yield throughout the detector. For a drift electric field value of 273 V/cm, the electric field within the detector varies by up to ~15%. To study the reconstructed track trajectories affected by the space charge effect within the detector, we utilized a pure sample of cosmic ray muons. We found that a data-driven method of measuring track distortions due to the space charge effect is necessary, and that total track distortion is decreasing as a function of time at the LArTPC top. This measurement technique may be applied to future LArTPC experiments.

**Primary author(s) :** Mr. BARNES, Christopher (University of Michigan)

**Presenter(s) :** Mr. BARNES, Christopher (University of Michigan)

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