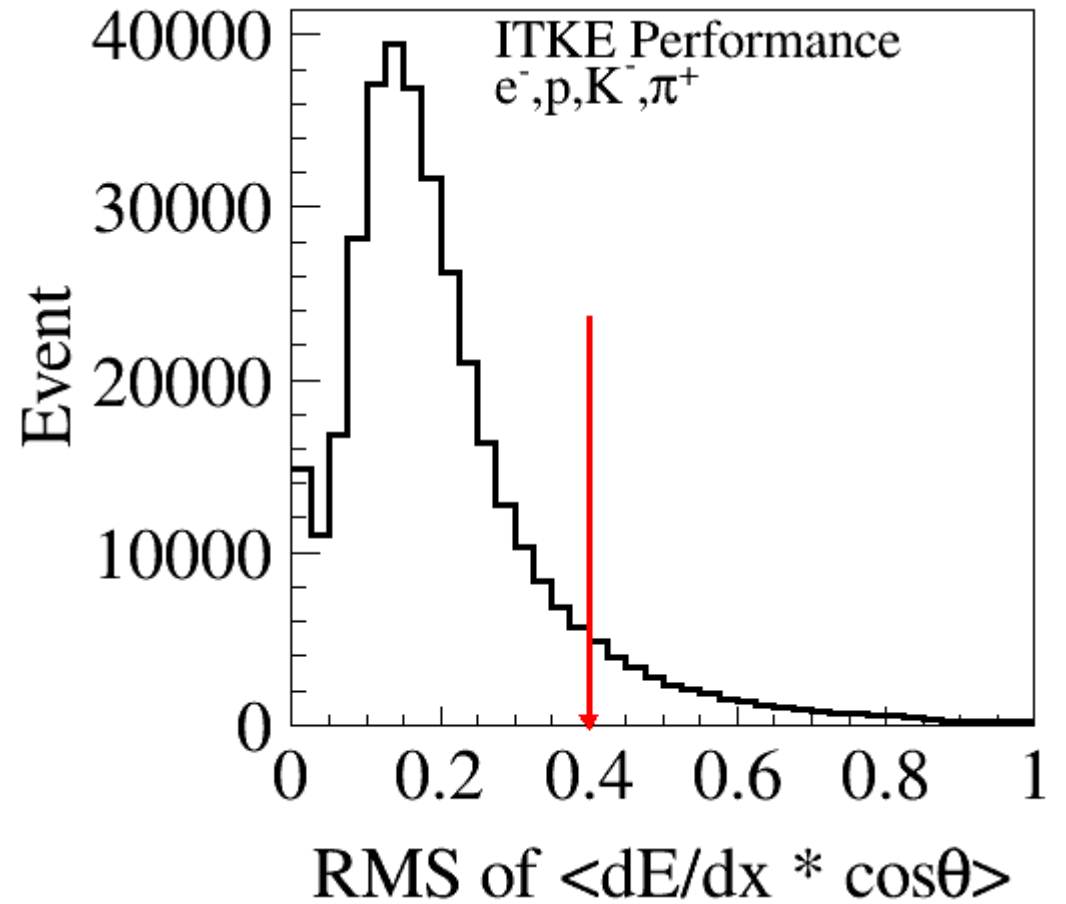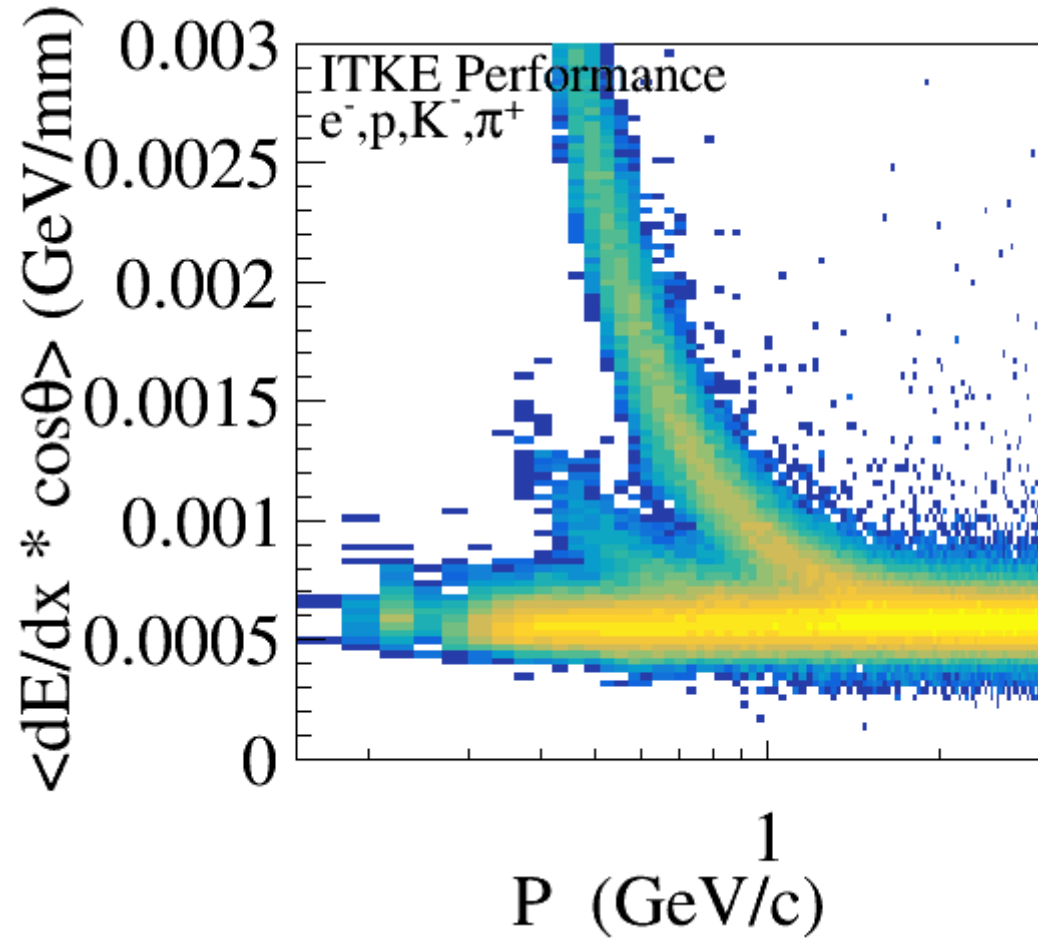# Particle Identification of ITKE

Chuangjie Xu ,
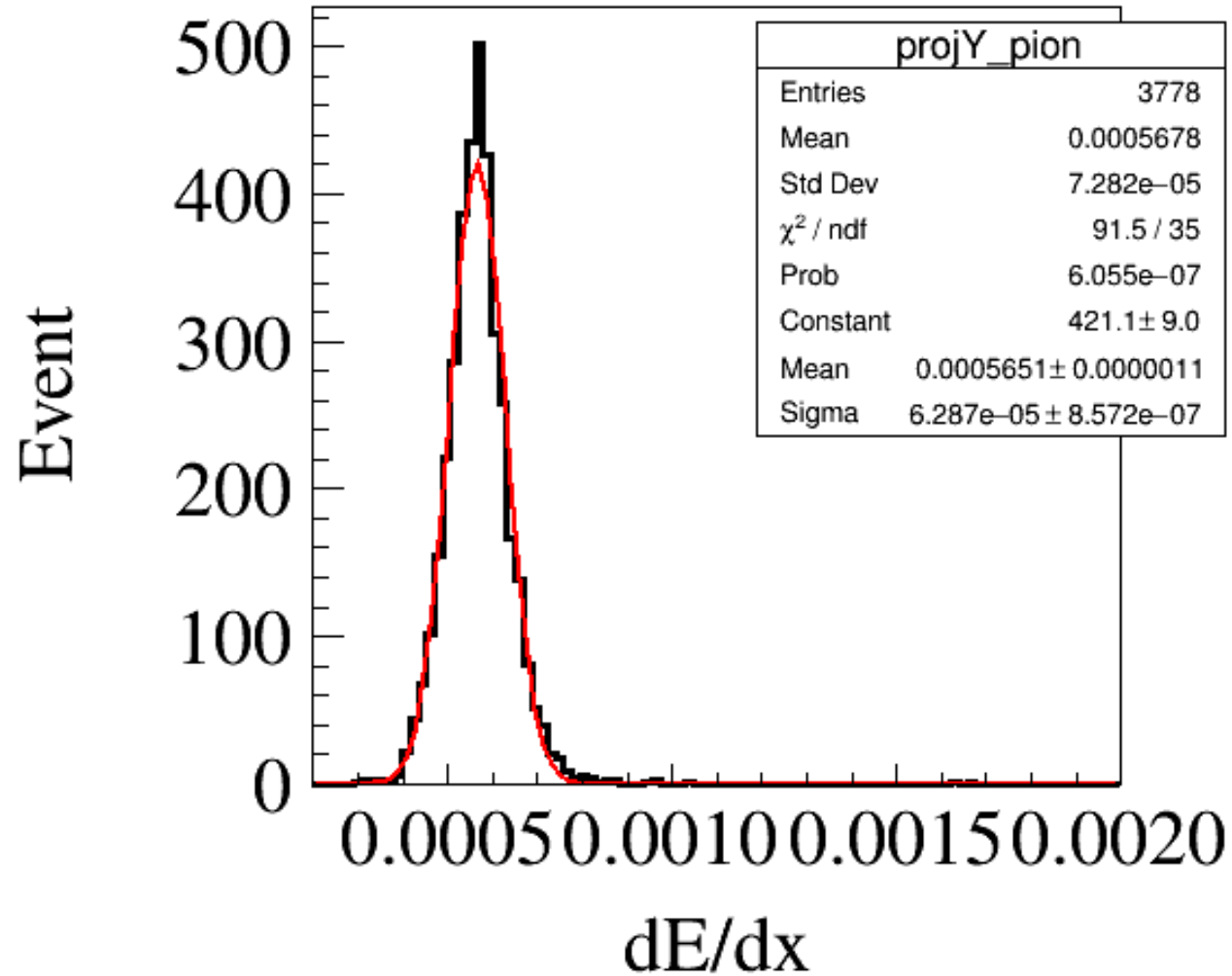
Sep. 06, 2024

dE/dx distribution versus momentum of ITKE

dE/dx resolution of pion at $2.0\ GeV < p < 2.1\ GeV$

Resolution: 11%

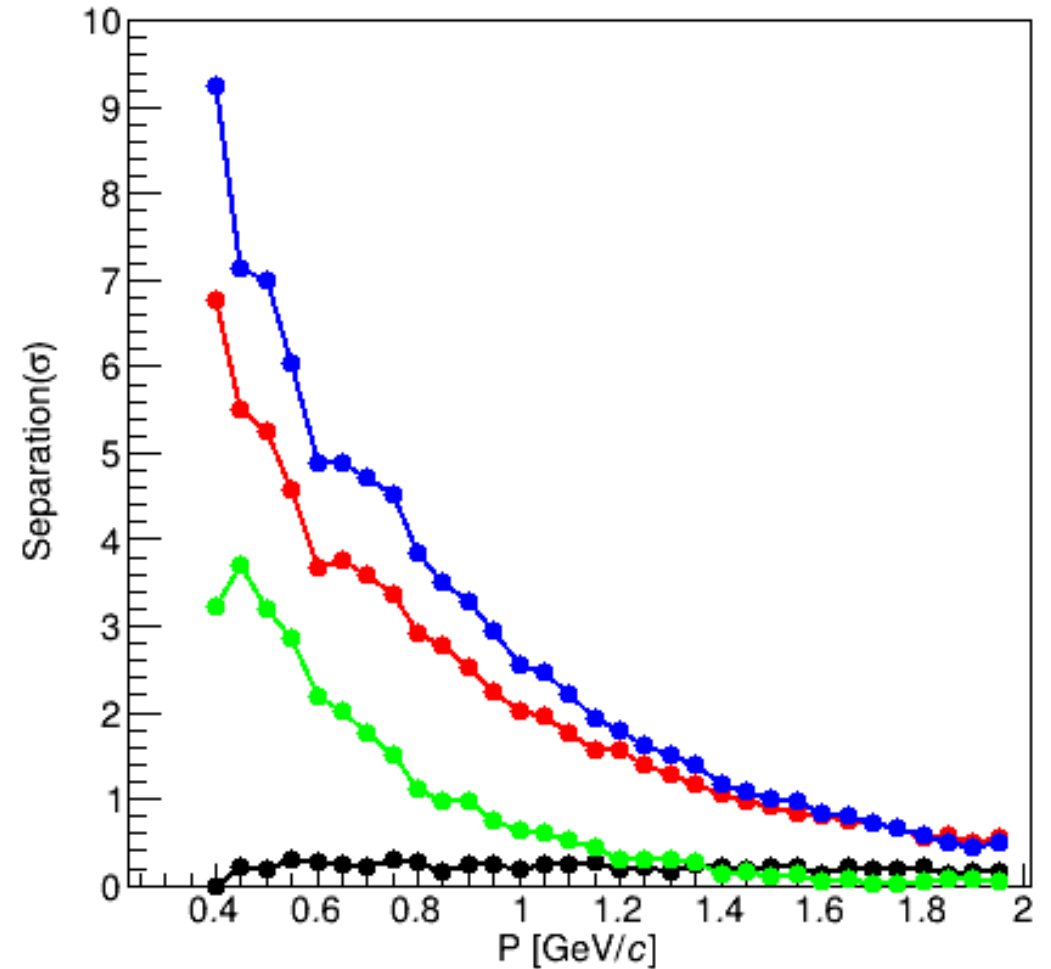| projY_pion	
Entries	3778
Mean	0.0005678
Std Dev	7.282e−05
χ^2 / ndf	91.5 / 35
Prob	6.055e−07
Constant	421.1± 9.0
Mean	0.0005651± 0.0000011
Sigma	6.287e−05± 8.572e−07

Separation of proton to other particles

$$S_{AB} = \frac{\Delta E_{AB}}{\sigma_{AB}} = \frac{dE/dx_A - dE/dx_B}{\sigma_{dE/dx(AB)}},$$

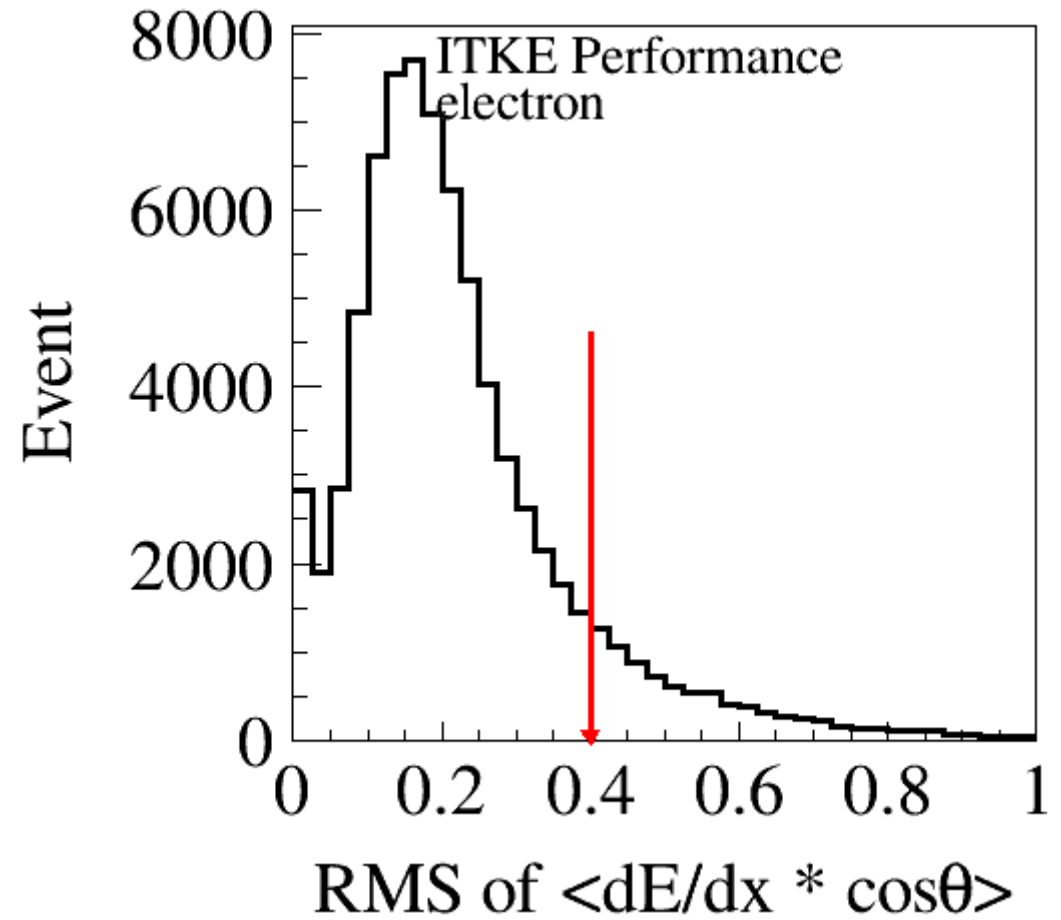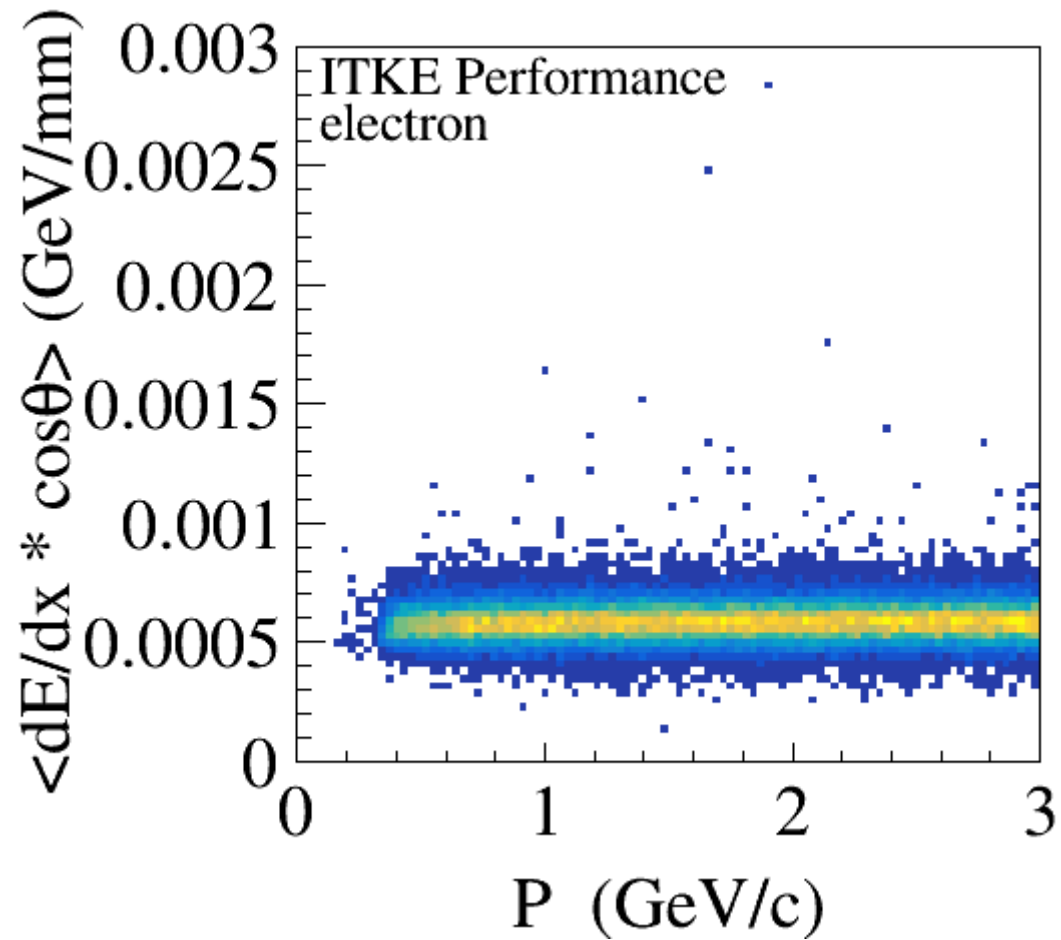$2 - 3\sigma$ K/π separation at momentum range $[0.4 - 0.6]$ GeV/c.

4

Summary
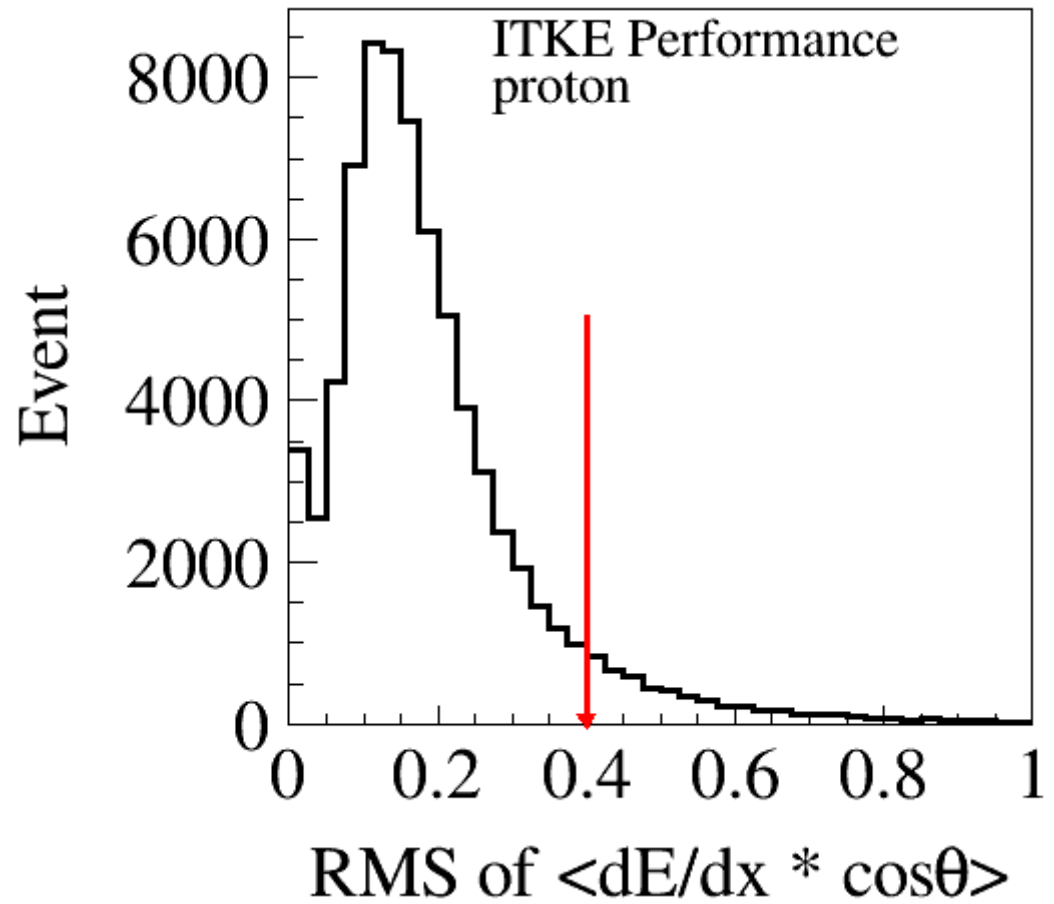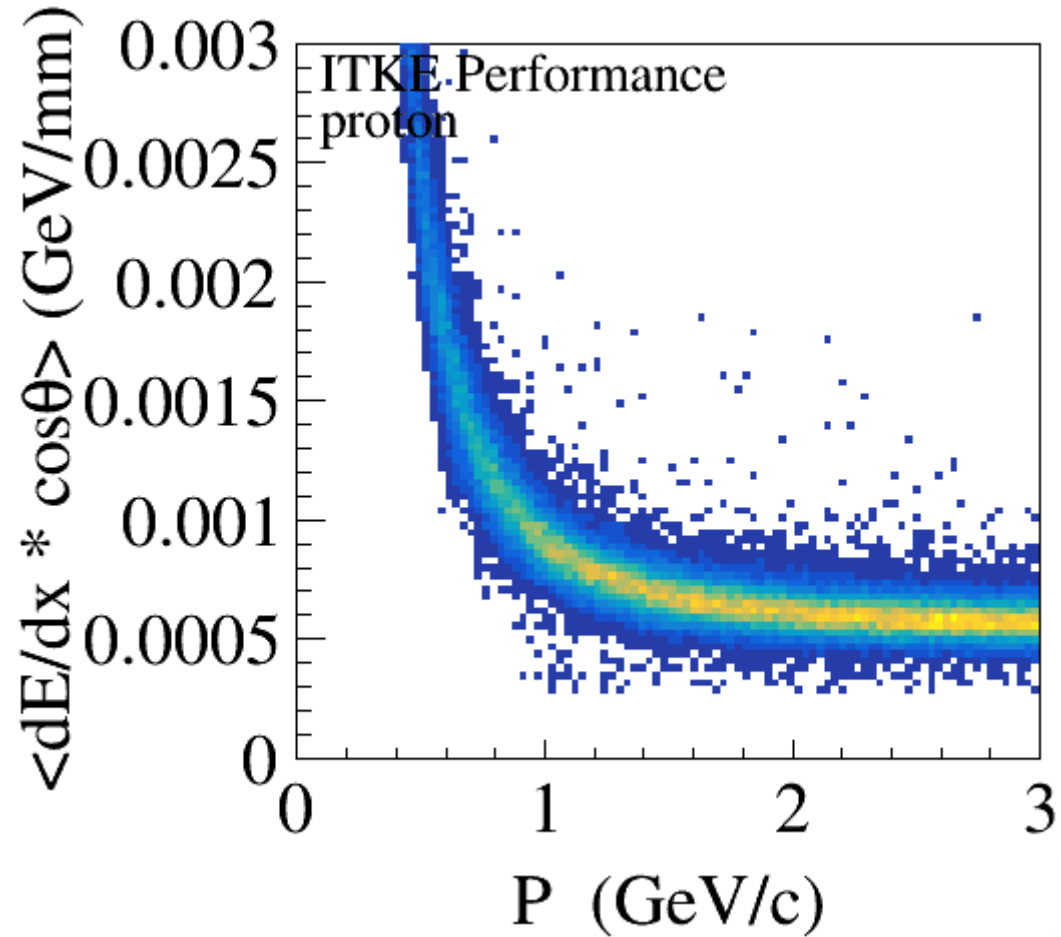
➢ At very low momentum region [0.0, 0.4] GeV/c, too low for particles to reach ITKE while have no hadronic reactions. Combination of VXD and ITKE for dE/dx measurements may help.

➢ Without dE/dx Calibration, a resolution of about 11% has been obtained for minimum ionization particles.

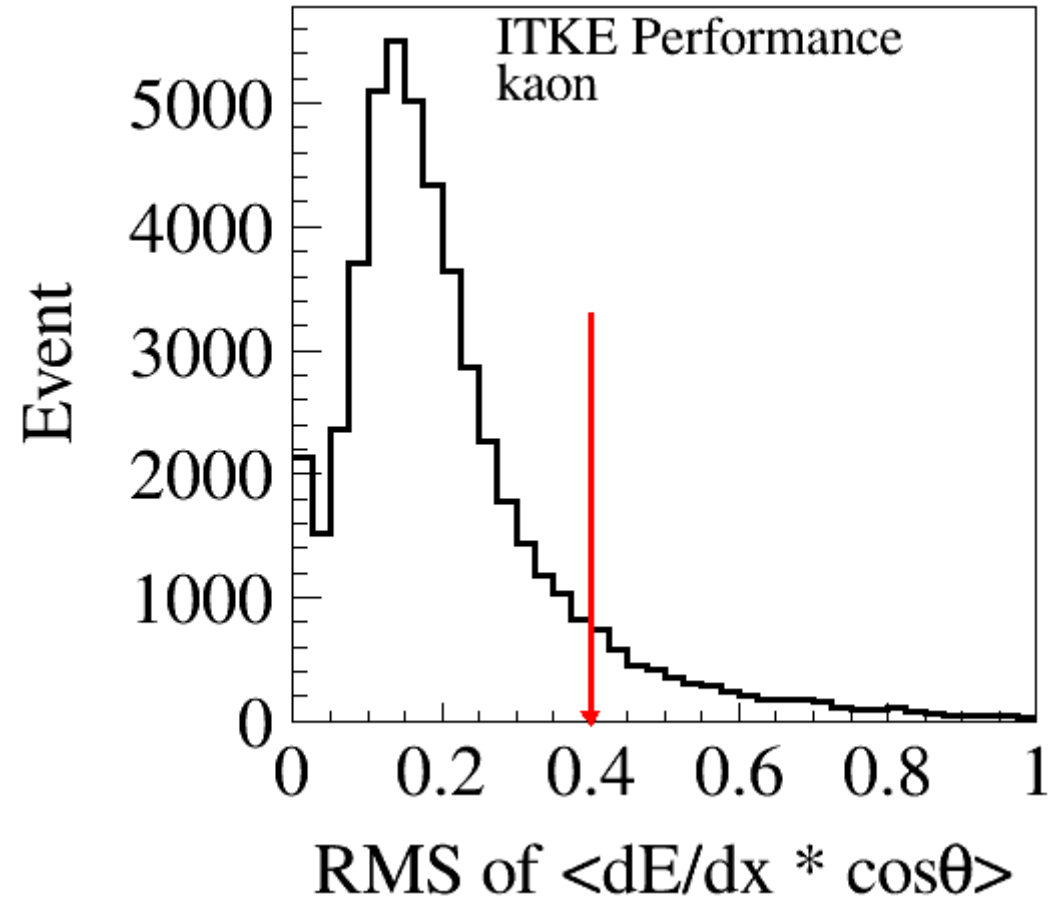➢ 2-3 σ K/π separation at momentum range [0.4 – 0.6] GeV/c.
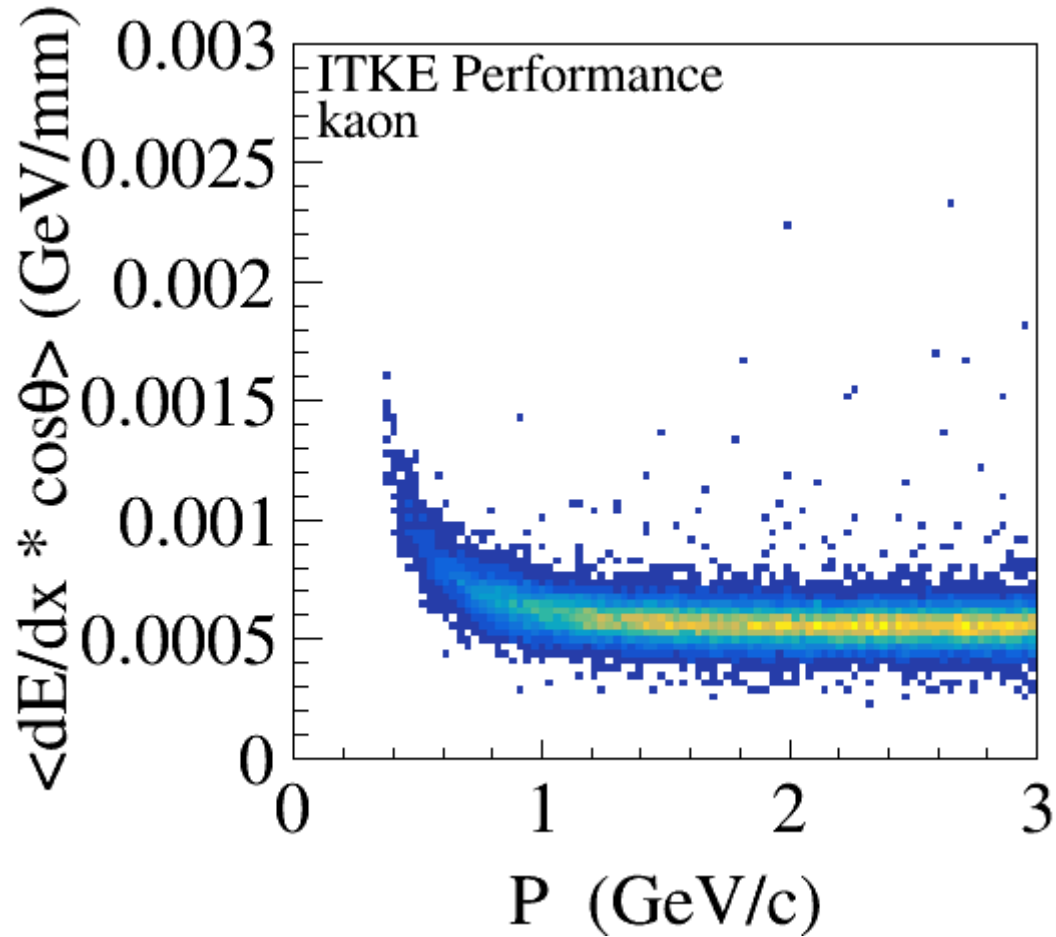
Backup

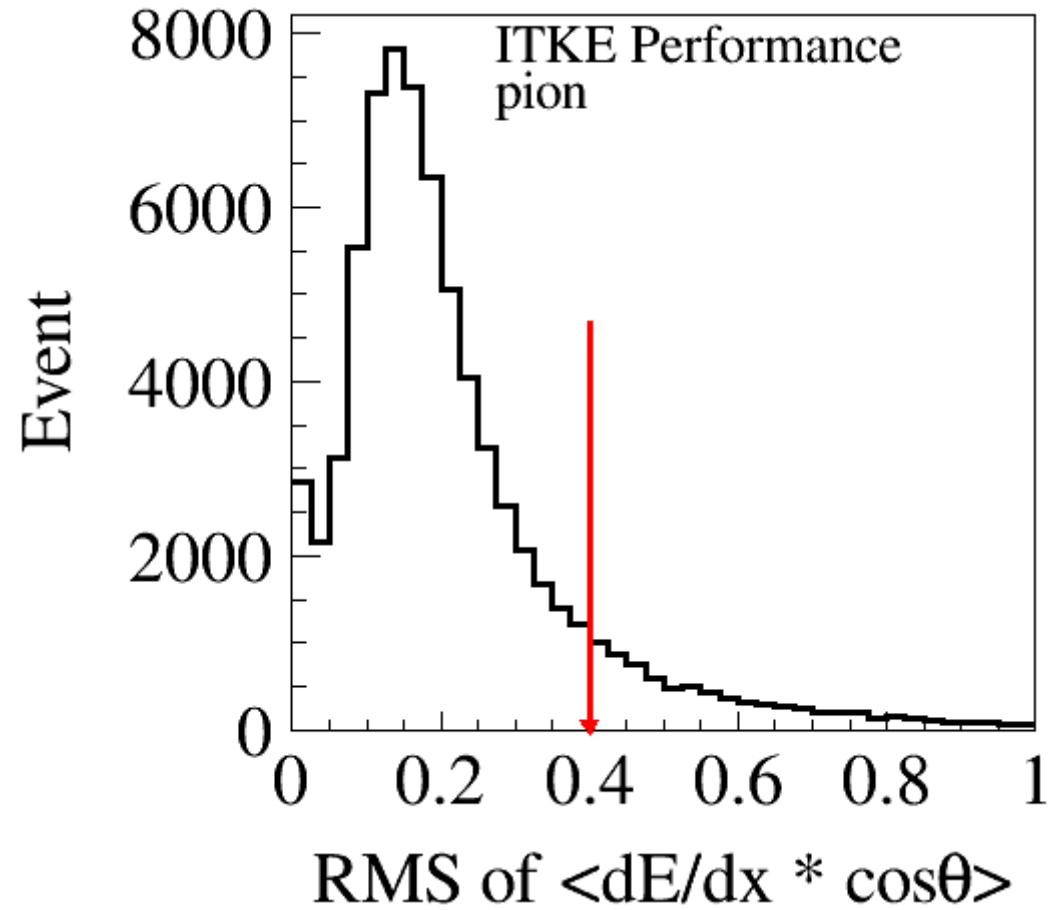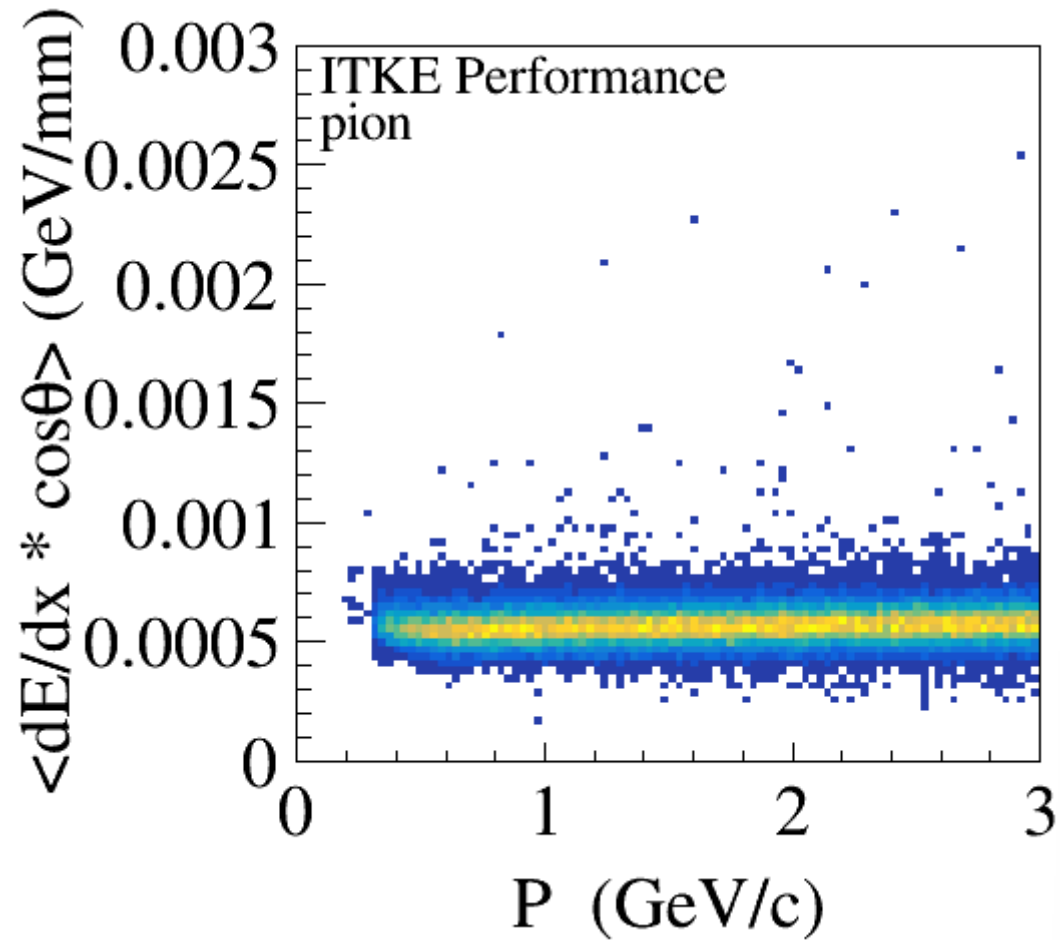# Electron dE/dx distribution of ITKE

Proton dE/dx distribution of ITKE

Kaon dE/dx distribution of ITKE

Pion dE/dx distribution of ITKE

muon dE/dx distribution of ITKE