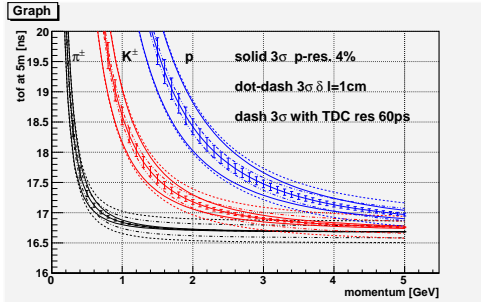


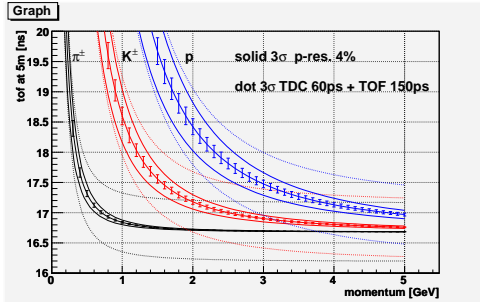
TOF Detector



TOF smearing

- TDC resolution (60 ps)
- Momentum resolution ($\sim 4\%$)
- path-length resolution (1 cm?)
- 6σ P2P separation

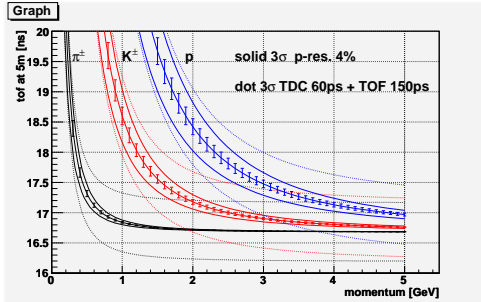
TOF Detector



TOF smearing

- TDC resolution (60 ps)
- Momentum resolution ($\sim 4\%$)
- path-length resolution (1 cm?)
- 6σ P2P separation
- TOF-Detector resolution (150 ps/plane)
scintillation rise-time,
decay time
light dispersion (geometry)
PMT TTS

TOF Detector

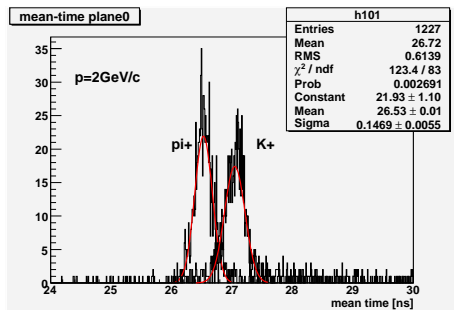


- optimize TOF-Detector resolution
- pion-kaon separation is most important

TOF smearing

- TDC resolution (60 ps)
- Momentum resolution ($\sim 4\%$)
- path-length resolution (1 cm?)
- 6σ P2P separation
- TOF-Detector resolution (150 ps/plane)
scintillation rise-time,
decay time
light dispersion (geometry)
PMT TTS

TOF pion-kaon separation



Particle Identification

- separate pions from kaons
- 3σ P2P separation not enough
- relative particle fluxes important (p-dependent)
- 6σ P2P 1.4 GeV/c ($\pi - K$ separation)

TOF Resolution

optimize TOF detector

- scintillator material (*rise time, decay time*)

TOF Resolution

optimize TOF detector

- scintillator material (*rise time, decay time*)
- photon statistics (*thick detector*)

TOF Resolution

optimize TOF detector

- scintillator material (*rise time, decay time*)
- photon statistics (*thick detector*)
- light dispersion (*detector geometry small*)

TOF Resolution

optimize TOF detector

- scintillator material (*rise time, decay time*)
- photon statistics (*thick detector*)
- light dispersion (detector geometry *small*)
- count rates (detector geometry *small*, PMT TT)

TOF Resolution

optimize TOF detector

- scintillator material (*rise time, decay time*)
- photon statistics (*thick detector*)
- light dispersion (detector geometry *small*)
- count rates (detector geometry *small*, PMT TT)
- light detection efficiency (*PMT QE*)

TOF Resolution

optimize TOF detector

- scintillator material (*rise time, decay time*)
- photon statistics (*thick detector*)
- light dispersion (detector geometry *small*)
- count rates (detector geometry *small*, PMT TT)
- light detection efficiency (*PMT QE*)
- PMT rise time (*PMT HV-devider*)

TOF Resolution

optimize TOF detector

- scintillator material (*rise time, decay time*)
- photon statistics (*thick detector*)
- light dispersion (detector geometry *small*)
- count rates (detector geometry *small*, PMT TT)
- light detection efficiency (*PMT QE*)
- PMT rise time (*PMT HV-divider*)
- PMT dispersion (*PMT TTS*)