

Kaons In Fluka

Nick Graf
MIPP Software Meeting
October 11, 2005

Fluka Simulation

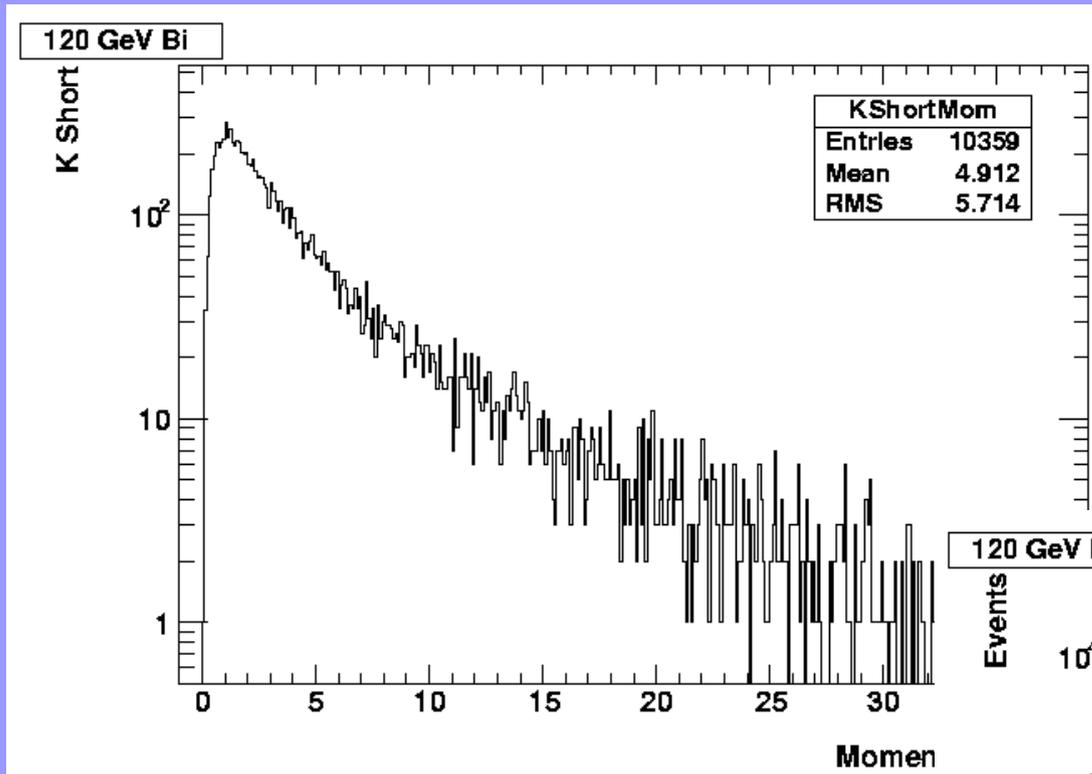
Target/Beam

- Bismuth, 1% interaction length
- 120 GeV proton beam
- 1 million protons on target

Kaons

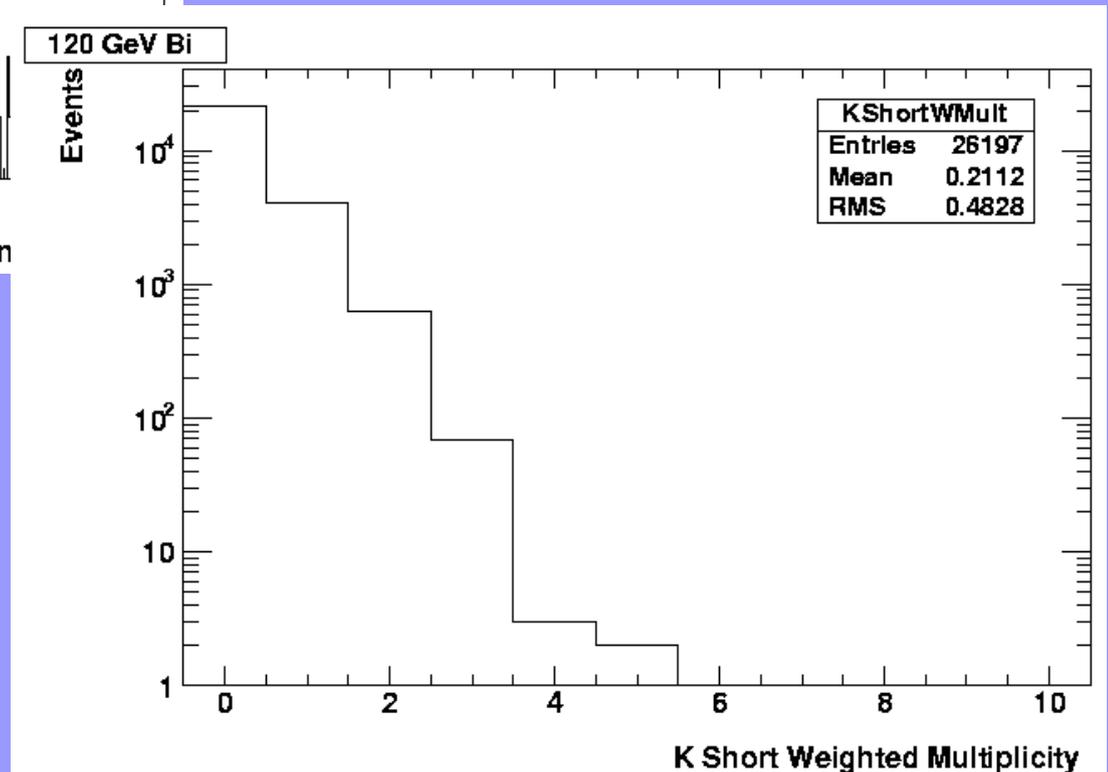
- Project K_s^0 through TPC
- Find enter and exit points
- Calculate probability of decay in TPC
- Weight momentum and multiplicity distributions

Kaon Distributions



Left: Avg. momentum is 5 GeV. Peak value is ~ 1 GeV

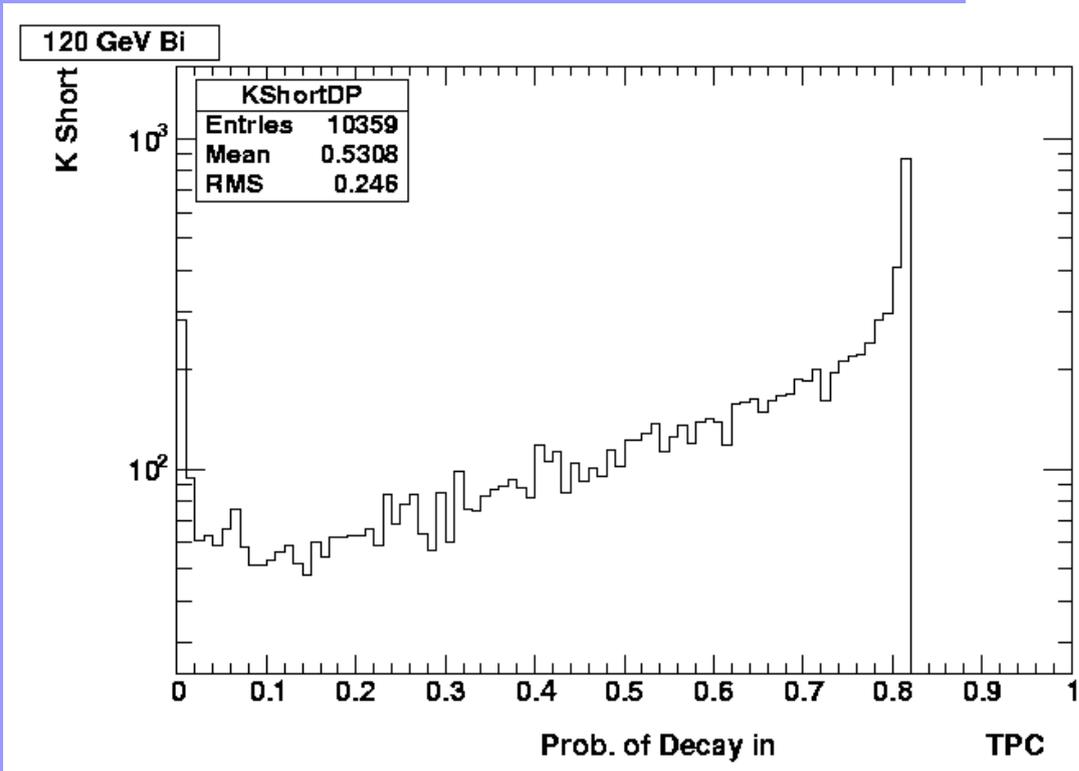
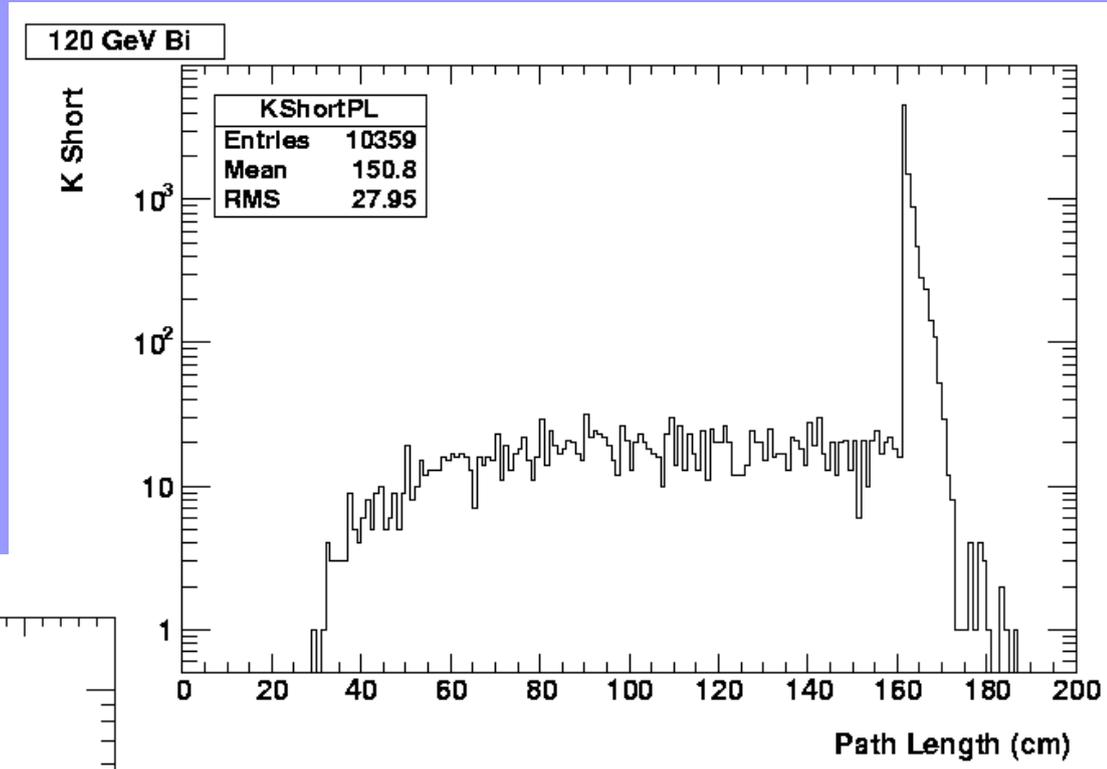
Right: Expect to see a Kaon once in every three events



Kaons In TPC

Right: Path length at exit point of TPC

Bottom: Probability of decay inside TPC



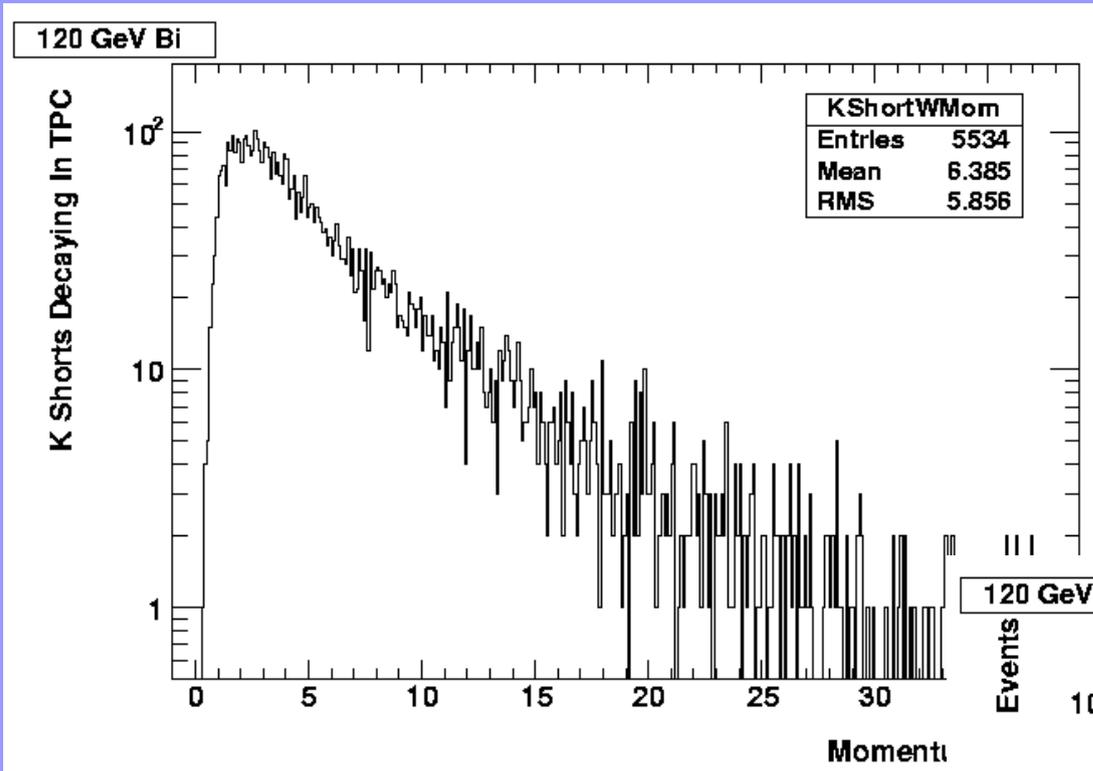
Survival probability

$$P(x) = e^{\frac{-mx}{tp}}$$

m=mass p=momentum

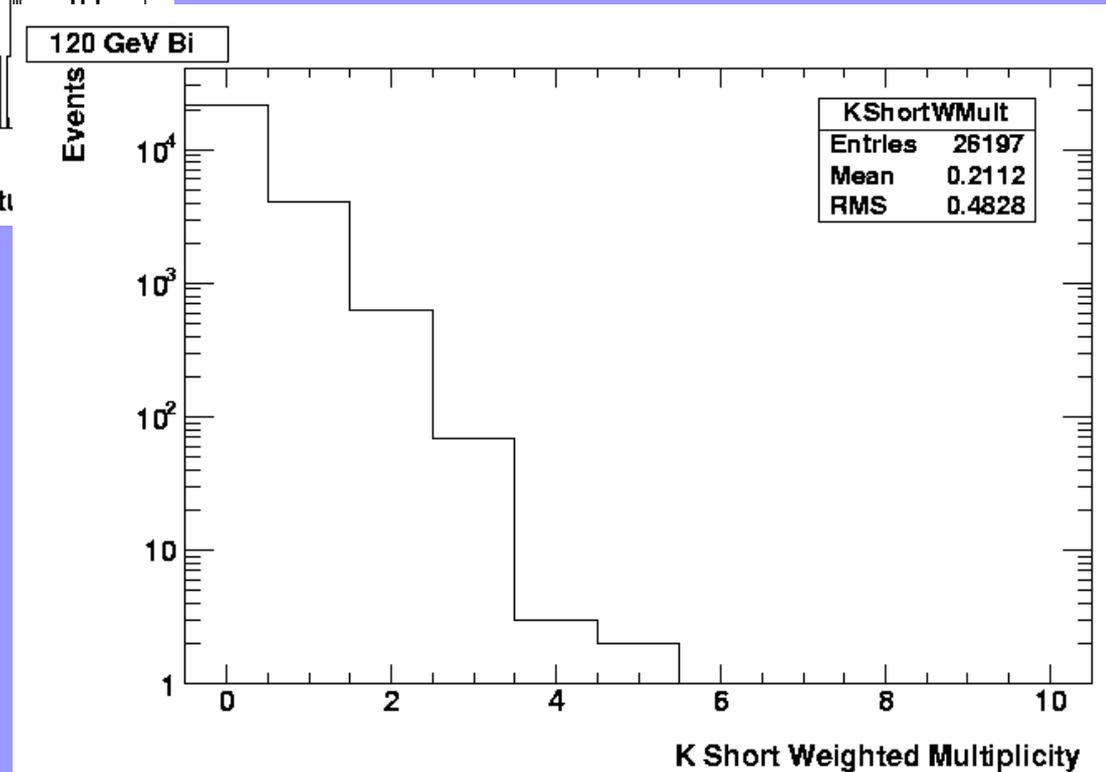
t=lifetime x=distance traveled

Weighted Distributions



Left: Momentum peaks around 2-3 GeV

Expect to see a Kaon inside TPC once in every 5 events



K Short Weighted Multiplicity

In Conclusion...

Approximately half of produced K-shorts decay inside the TPC volume

We should expect to see one such decay in every five events

These kaons are likely to have a momentum of around 2-3 GeV

This corresponds to a minimum pion momentum of ~500 MeV