Introduction

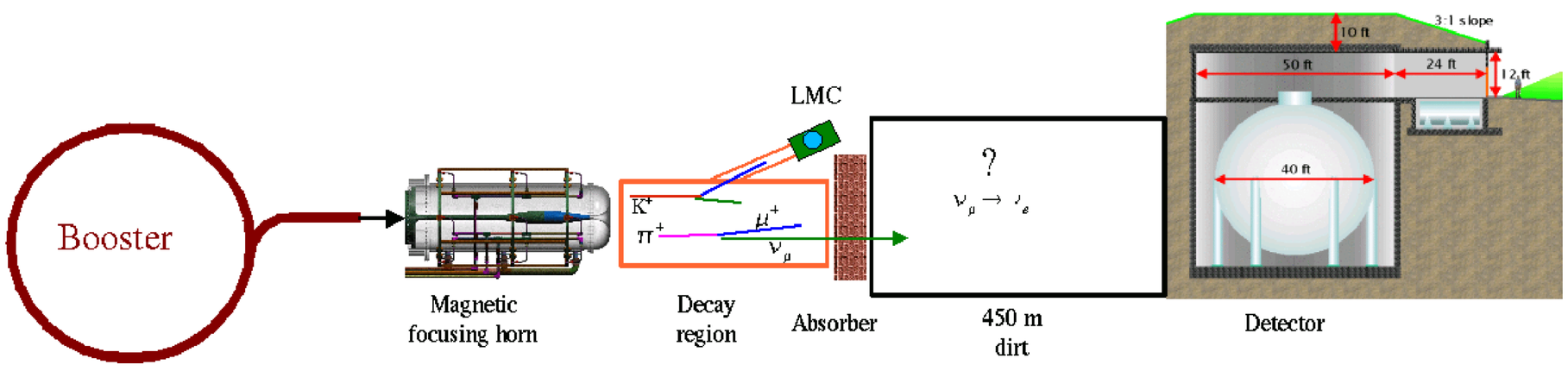
The MiniBooNE experiment is designed to address the unconfirmed oscillation signal seen by the LSND experiment at Los Alamos (a 0.25% oscillation probability with a 3.3σ statistical significance). Searching for the appearance of such a small fraction of electron neutrinos in a beam of muon neutrinos is a difficult task. In this poster we give a few details about the reconstruction and particle identification methods used in the experiment.

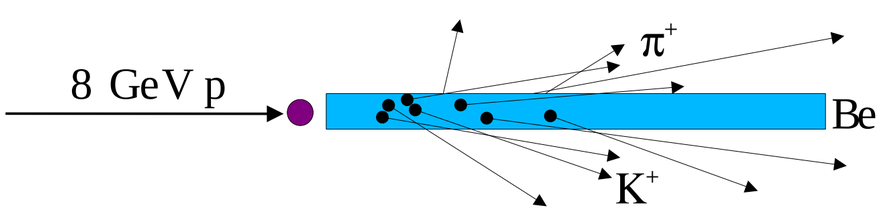
Important steps since last review

August 2005: Publication of HARP thin target analysis.

January 2006: Switch horn polarity to begin antineutrino running.
March 2006: Booster delivers 7.2 x 10^{20} POT to MiniBooNE. ~5000 events are observed in the antineutrino mode configuration.
Nov05- May 2006: Made substantial progress in refining Optical Model through *in situ* calibrations.

Neutrino source



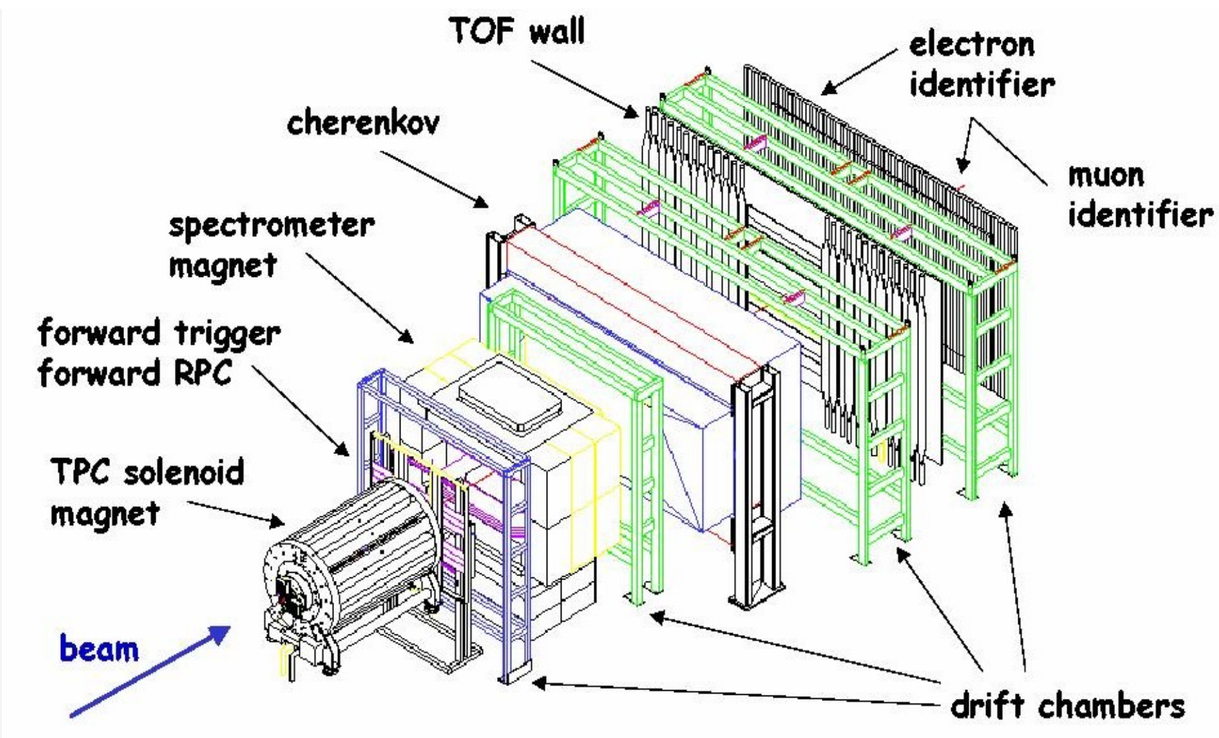


$\pi^+ \rightarrow \mu^+ + \nu_\mu$	source of ν_μ
$\mu^+ \rightarrow e^+ + \bar{\nu}_\mu + \nu_e$	source of ν_e background
$K^+ \rightarrow \mu^+ + \nu_\mu$	source of ν_μ
$K^+ \rightarrow e^+ + \pi^0 + \nu_e$	source of ν_e background
$K^0_L \rightarrow e^+ + \pi^- + \nu_e$	source of ν_e background

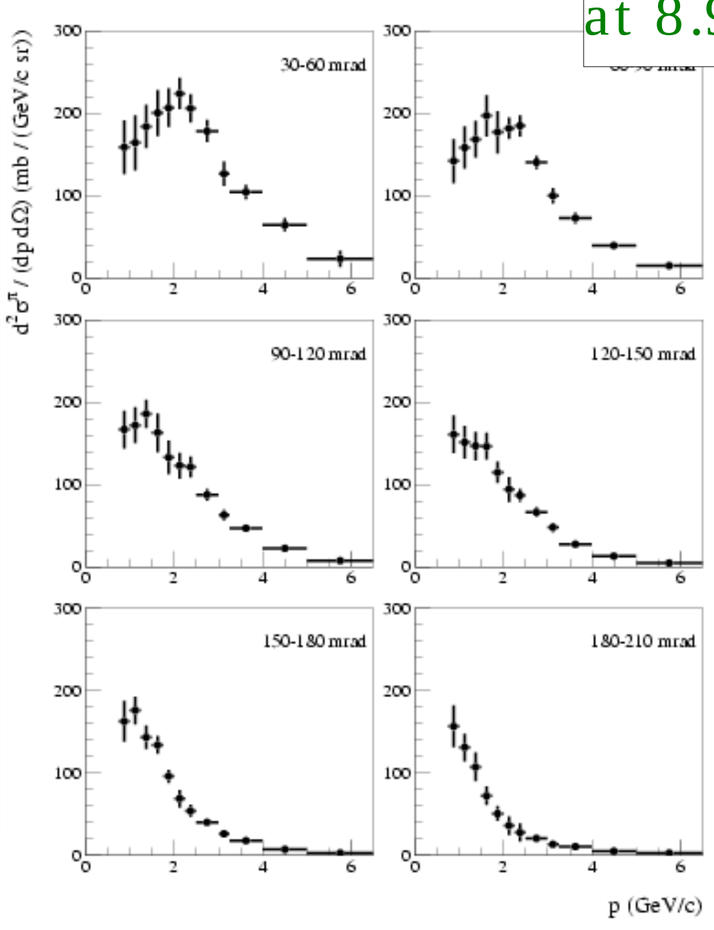
- Knowing the production cross sections for mesons produced at the target is critical for determing the neutrino flux.
- In summer of 2002, the cross sections for an 8 GeV proton beam on Be were measured by the HARP experiment at CERN.

HARP has published its first results on Al **(Nucl.Phys.A752:24-33,2005).** Be results to be published this summer.

Harp Setup

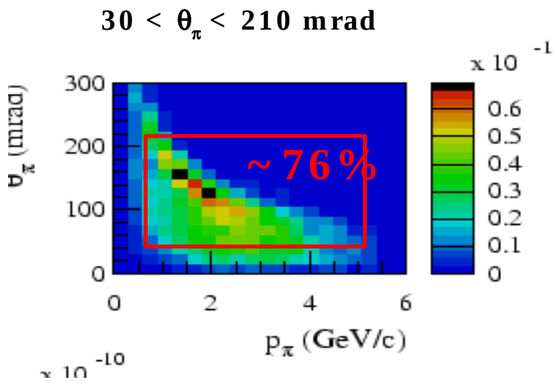


proton-> Be collisions at 8.9 GeV/c



piplus cross section with full statistical plus systematic errors shown (excludes the 4% normalization error)

$0.75 < p_\pi < 6.5$ GeV/c
$30 < \theta_\pi < 210$ mrad



Momentum and angular distribution of pions decaying to a neutrino that passes through the MB detector.