My first look on charm-events

Malte Wilfert
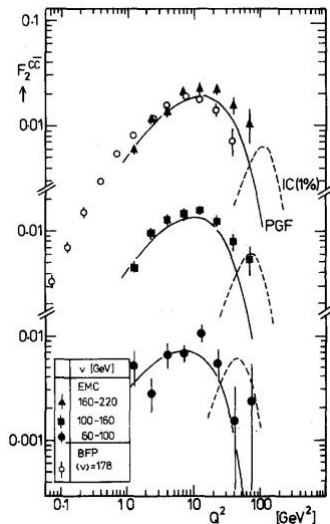
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Outline

Aim of the Diploma thesis

- Measured by EMC:
  - Nuclear Physics B 213 (1983)
  - Nuclear Physics B 461 (1996)

- Channel used: $D \longrightarrow K^{(*)}\mu\nu_{\mu}$

- Diploma thesis: look on F_2^c with D^* events

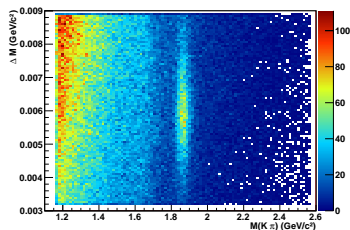- Using Sasha Zvyagins selected data for 2004 (plus eventually 2006)

Data set

- Data selection

  - Events with primary vertex

  - ≥ 3 additional hadron tracks

  - PID & momentum cuts

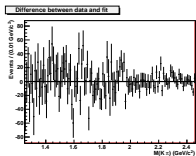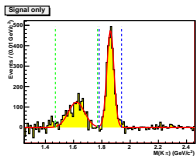 - $3.2 < |\Delta M| < 8.9$ MeV

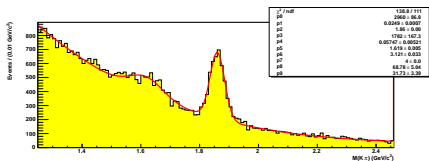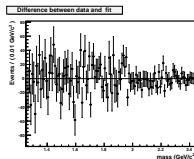 $\Delta M = m(K,\pi,\pi) - m(K,\pi) - m(\pi)$

  - target cut

- Background suppression

  - $z = \frac{E(D^0)}{\nu} > 0.2$

  - $|\cos(\theta_K)| < 0.9$

Fit results

Polynomial Background

Exponential Background

Background subtraction

Background:

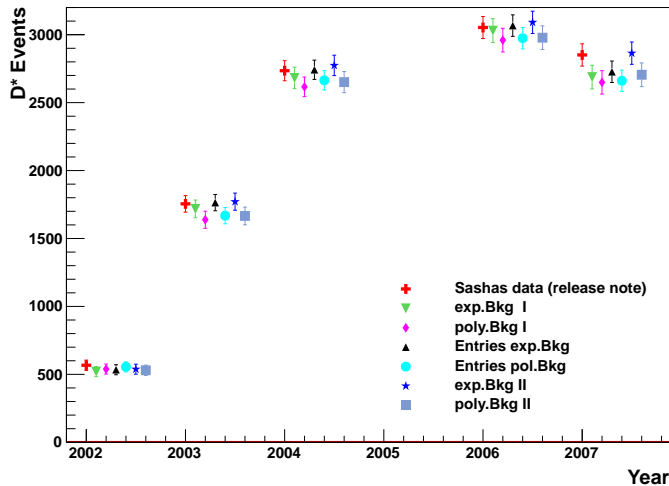- $e^{c_1 \cdot x} + c_2$

- $(x - c_1)^{c_2} + c_3$

Signal:

- $\frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$

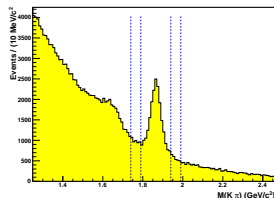Missing π^0-Peak:

- $\frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$
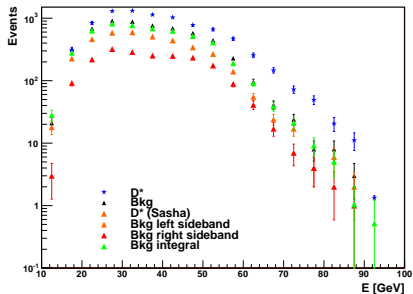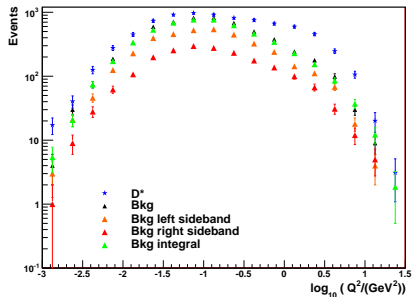
- Function, describing the shape

Comparison of different models
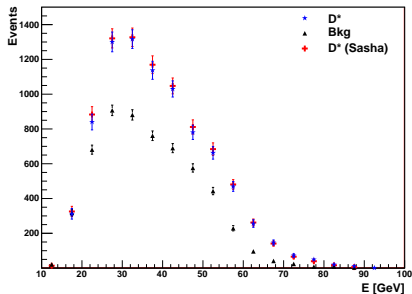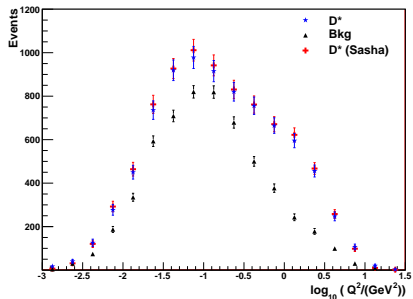
Kinematic distribution

- Data from 2002 - 2006

- No acceptance correction

- Number of D^*-events obtained from fit

- Background

  - Sideband

  - Integration of the function, describing the background

Kinematic distribution

Kinematic distribution

Next steps

- Continue following the charm paper

    - Determine the acceptance for D-mesons

    - Determine the Semi-inclusive differential cross section

- Finally: Determine F_2^c