

D* Production in Charged Current Reactions

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Update HERA 1 analysis for HERA 2

From Heavy Flavour Meeting, 29.01.2004

Found 7.19 ± 2.96 $D^{*\pm}$ Events

This Leads to Estimate of about 32 Events for Combined HERA 1 and 2

For charged currents we analyzed HERA 1 and HERA 2 runs

No Trigger Selection In HERA 1

Missing Transverse Momentum $> 12 \text{ GeV}$

Missing Pt; outer cells not included $> 10 \text{ GeV}$

$Q^2 > 200$ and $< 60000 \text{ GeV}^2$

$y_{jb} < 0.9$

Same for HERA2 but with Trigger

D* in Charged Current Production

$D^{*\pm}$ Selection

$$pt(D^{*\pm}) > 3 \text{ GeV}$$

$$-1.5 < \eta(D^{*\pm}) < 1.5$$

$$pt(D^{*\pm})/Et_{cone} > 3 \text{ GeV}$$

$$pt(K), pt(\pi) > 0.4 \text{ GeV}$$

$$pt(\pi^{(slow)}) > 0.12 \text{ GeV}$$

$$1.80 < M(K\pi) < 1.92 \text{ GeV}$$

Charged Current Monte Carlo (Ariadne)

Selection Used in Charged Current Monte Carlo paper

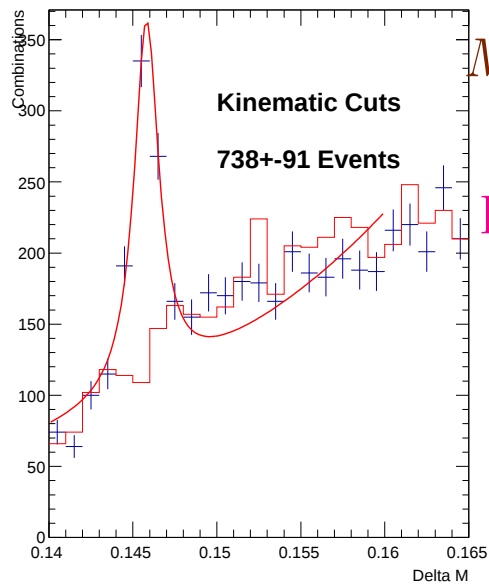
Referred to as Quality Cuts in Plots Below

Fits to Breit Wigner + Exponential

Histograms are Wrong Charge Combinations

D* in Charged Current Production

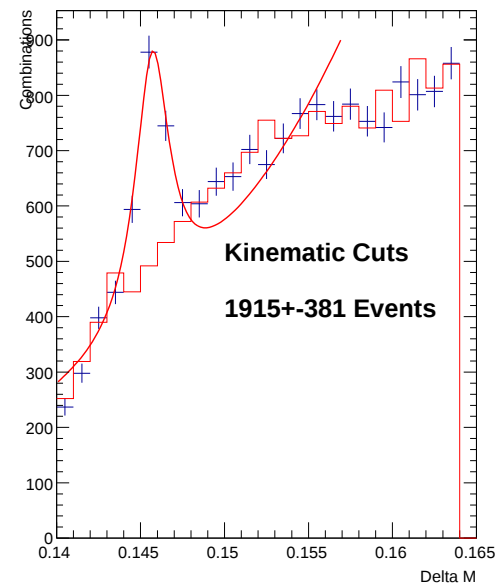
HERA 1 Charged Current MonteCarlo



$$M = 146 \pm 0.07 \text{ MeV}$$

$$\Gamma = 1.8 \pm 0.3 \text{ MeV}$$

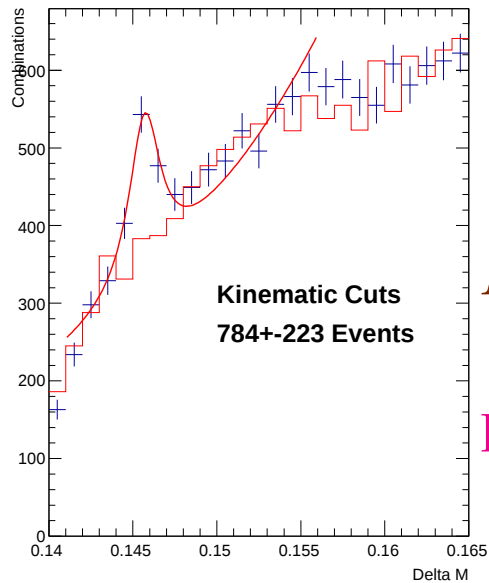
HERA 1 + HERA 2 Charged Current MonteCarlo



$$M = 146 \text{ MeV (fixed)}$$

$$\Gamma = 2.5 \text{ MeV (fixed)}$$

HERA 2 Charged Current Monte Carlo

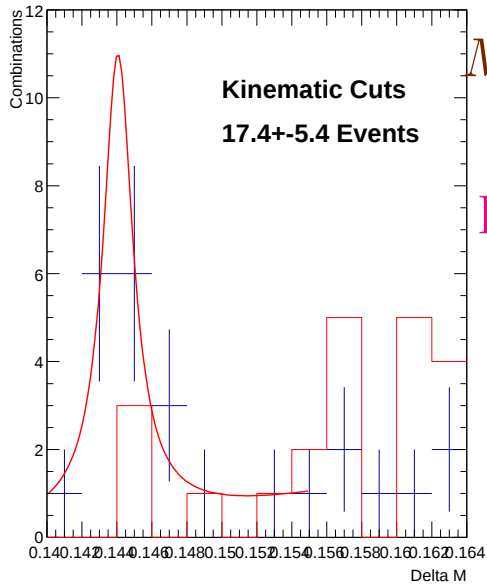


$$M = 146 \text{ MeV (fixed)}$$

$$\Gamma = 2.3 \pm 0.6 \text{ MeV}$$

D* in Charged Current Production

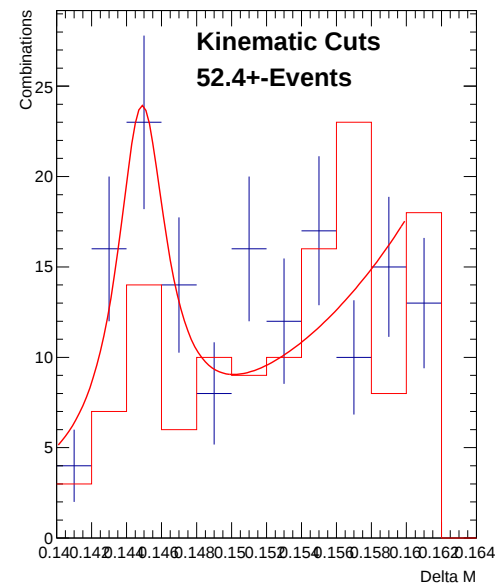
HERA 1 Charged Current Data



$$M = 144 \pm 0.4 \text{ MeV}$$

$$\Gamma = 2.1 \pm 2.5 \text{ MeV}$$

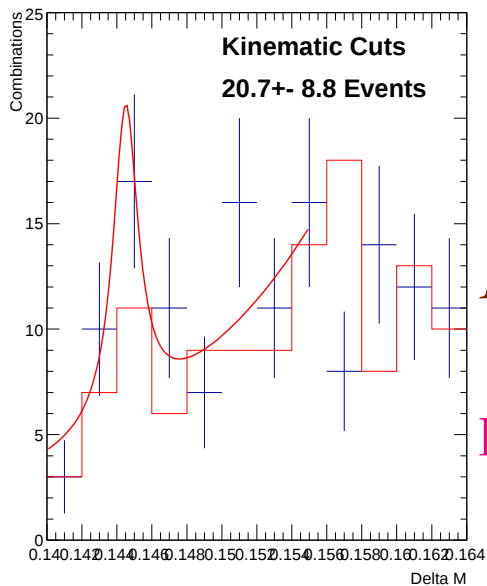
HERA 1 + HERA 2 Charged Current Data



$$M = 145 \pm 0.6 \text{ MeV}$$

$$\Gamma = 2.8 \pm 1.1 \text{ MeV}$$

HERA 2 Charged Current Data

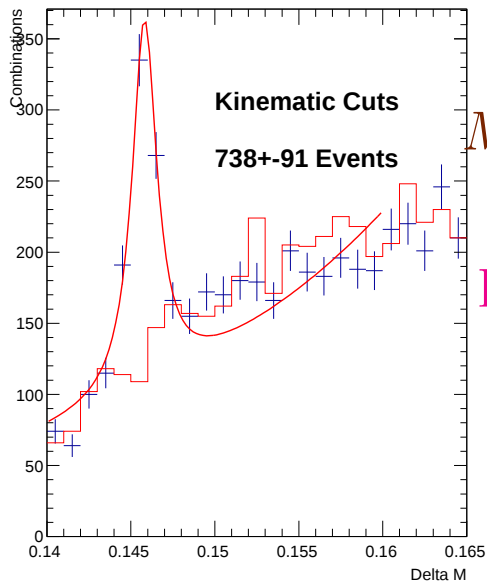


$$M = 145 \text{ MeV (fixed)}$$

$$\Gamma = 1.8 \pm 1.2 \text{ MeV}$$

D* in Charged Current Production

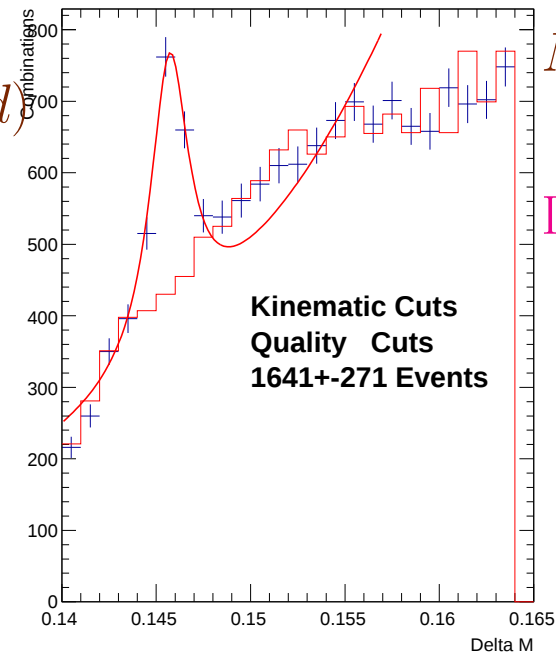
HERA 1 Charged Current MonteCarlo



$$M = 146 \text{ MeV}(\text{fixed})$$

$$\Gamma = 1.8 \pm 0.3 \text{ MeV}$$

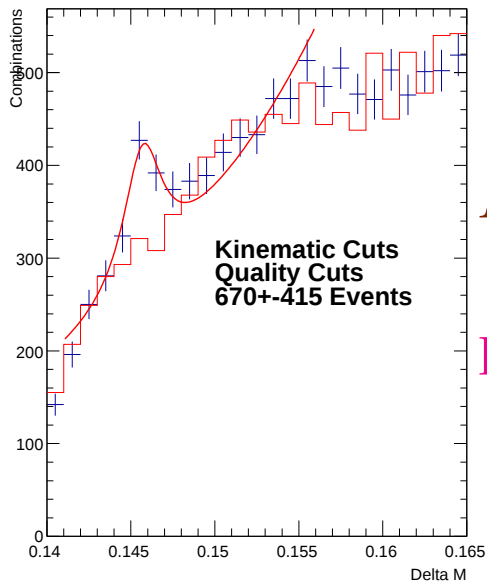
HERA 1 + HERA 2 Charged Current MonteCarlo



$$M = 146 \text{ MeV}(\text{fixed})$$

$$\Gamma = 2.5 \text{ MeV}(\text{fixed})$$

HERA 2 Charged Current MonteCarlo

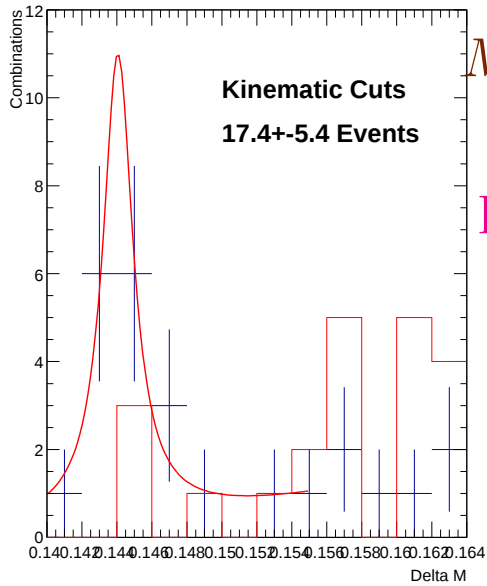


$$M = 146 \text{ MeV}(\text{fixed})$$

$$\Gamma = 2.8 \pm 1.7 \text{ MeV}$$

D* in Charged Current Production

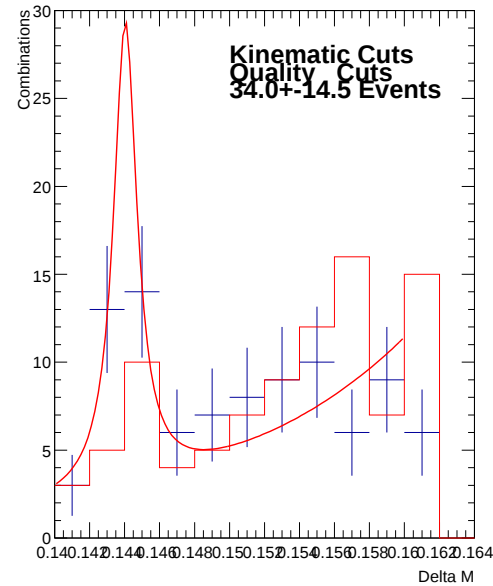
HERA 1 Charged Current Data



$$M = 144 \pm 0.9 \text{ MeV}$$

$$\Gamma = 4.0 \pm 2.2 \text{ MeV}$$

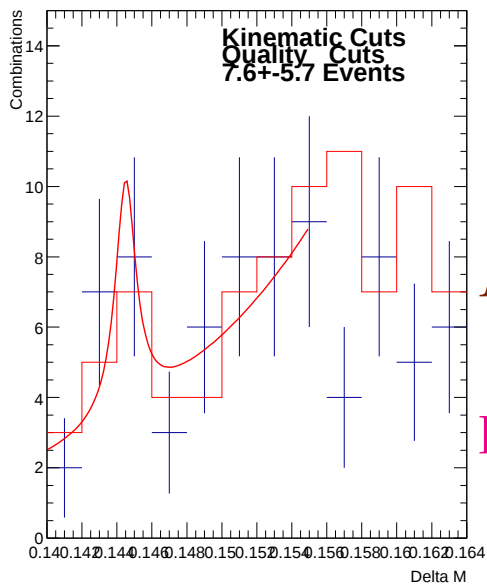
HERA 1 + HERA 2 Charged Current Data



$$M = 144 \pm 0.2 \text{ MeV}$$

$$\Gamma = 1.6 \pm 2.3 \text{ MeV}$$

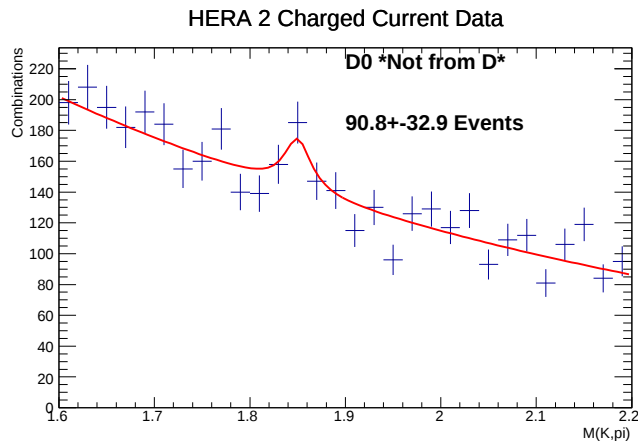
HERA 2 Charged Current Data



$$M = 145 \text{ MeV (fixed)}$$

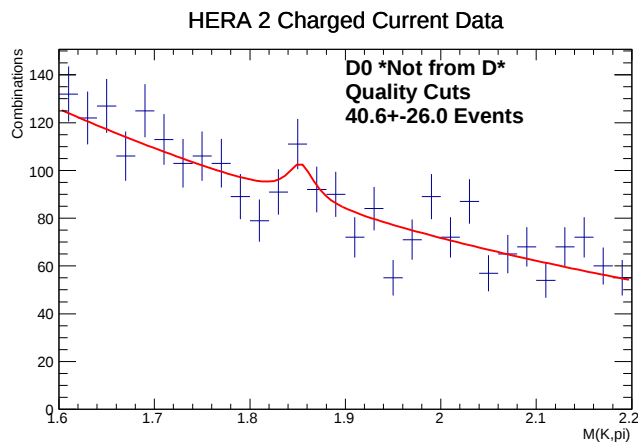
$$\Gamma = 1.4 \pm 2.1 \text{ MeV}$$

D0 in Charged Current Production



$$M(K\pi) = 1.850 \pm 0.6$$

$$\Gamma(K\pi) = 0.035 \quad (fixed)$$



$$M(K\pi) = 1.853 \pm 0.9$$

$$\Gamma(K\pi) = 0.035 \quad (fixed)$$