7.8 Summary

The cross section measurement is summarized in Table 22. The first error is statistical error. The second error is systematic error(16%). Number of elastic J/ψ events was obtained by subtracing out diffractive J/ψ events(15%). The number of J/ψ in the two W bins should add up to the total number J/ψ, so should the electroproduction cross section σ_{ep}. The small discrepancy here is due to statistical error in subtraction of the continuum background performed by ML fitting. The photoproduction cross section $\sigma_{\gamma p}$ of $(45 \pm 9 \pm 7)$nb falls below the ZEUS preliminary result, $(62 \pm 13 \pm 13)$nb, for several reasons. In the ZEUS preliminary result, first, diffractive content was not subtracted; second, the invariant mass cut was at 2.0GeV instead of 2.4GeV; third, the TLT trigger BGF05 was included in event selection; fourth, more stringent track-cluster matching was required in this analysis.

Table 22: Summary of the cross section measurement

$\sqrt{s_{\gamma p}}$ range(GeV)	40-140	40.0-71.3	71.3-140.0
$F(y_2) - F(y_1)$	0.112	0.058	0.054
W^* (GeV)	74.8	53.4	99.9
acceptance	0.35	0.35	0.35
number of J/ψ	61 ± 11	28 ± 7	35 ± 8
number of elastic J/ψ	52 ± 10	24 ± 6	30 ± 7
elastic $\sigma_{ep}(y_1, y_2)$ (nb)	$5.1 \pm 1.0 \pm 0.8$	$2.3 \pm 0.6 \pm 0.4$	$2.9 \pm 0.7 \pm 0.5$
elastic $\sigma_{\gamma p}$ (nb)	$45 \pm 9 \pm 7$	$40 \pm 10 \pm 6$	$54 \pm 13 \pm 9$