

Missing mass kinematics

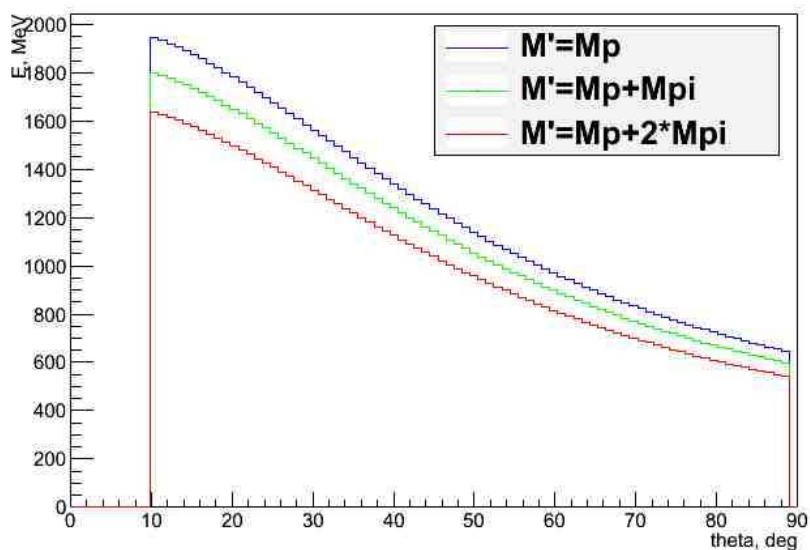
Reaction under study $e + p \rightarrow e' + p^*$

Scattered electron energy as function of missing mass M_p^* is

$$E' = \frac{E - (M_p^* - M_p) \frac{1}{2} \left(\frac{M_p^*}{M_p} + 1 \right)}{1 + \frac{2E}{M_p} \sin^2 \frac{\theta_{\text{Lab}}}{2}}$$

OLYMPUS $E=2\text{GeV}$

$M_p=0.938\text{ GeV}$ $M_{\pi}=0.14\text{ GeV}$

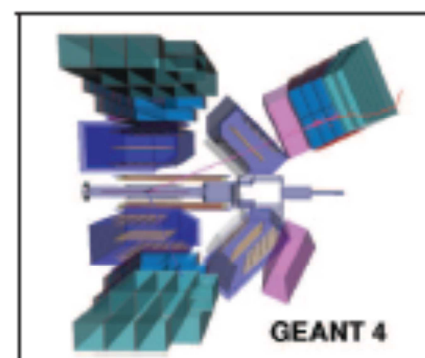
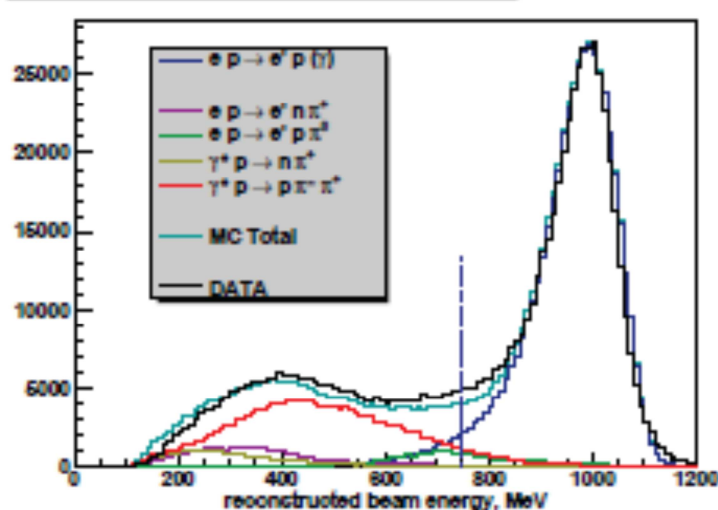


MC simulation of the background processes

- Geant4 detector model
- MAID2007 and 2-PION-MAID based event generator for single- and double-pion electro-production
- ESEPP event generator for elastic ep scattering with bremsstrahlung

Result for the reconstructed beam energy spectrum (run II, LA-kinematics), after just loose $(\Delta\phi, \Delta\theta)$ -cuts applied:

DATA and ESEPP+MAID2007+GEANT4



when all cuts applied:
 $N_{background} / N_{elastic} < 1\%$