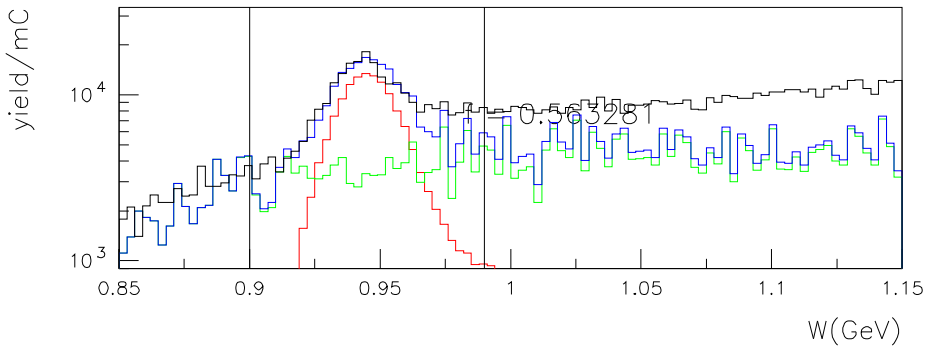
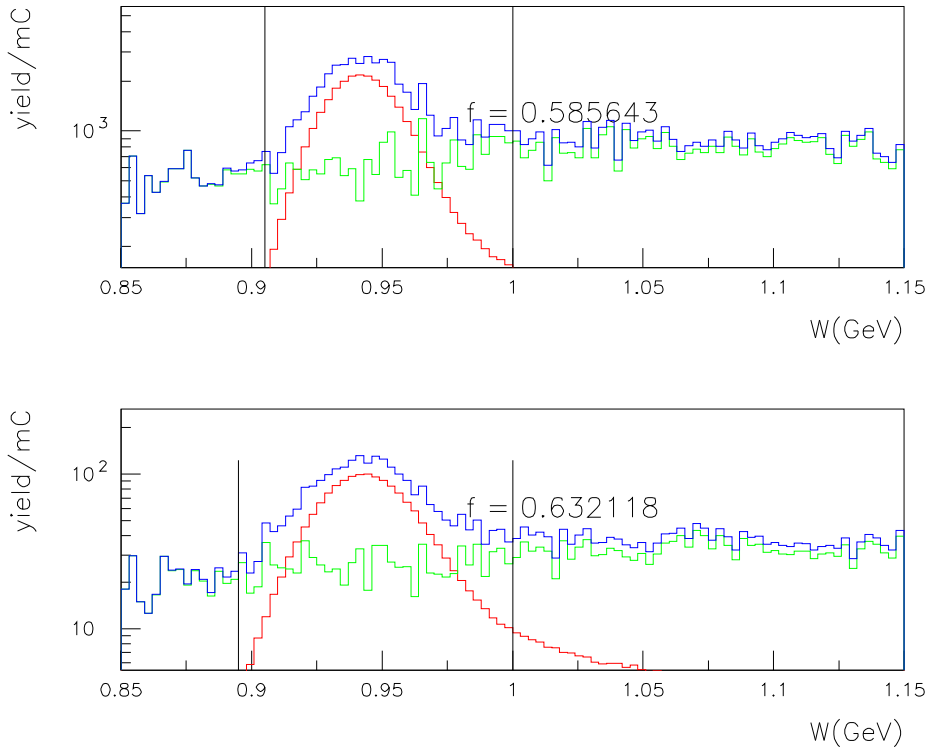
PR04-014 — About the dilution factor

Why did we choose loose cut in W when estimating the dilution factor?

- RSS data with parallel target field
  - black=data, red=elastic-simc, green=qe-simc
  - the elastic peak from data is in general (and always) wider than the simulation due to the imperfection of the spectrometer; We added additional smearing in SIMC to simulate this. (Plots in the proposal were generated w/o additional smearing).
  - these data are from target field parallel configuration. With perpendicular field, the elastic peak is even wider (the reconstruction is less perfect for perpendicular setting). Analysis work is underway to understand the perpendicular data and improve the software. It is possible that the peak width for perpendicular setting will be improved to close to what is shown here;
  - these data are from resonance region. There are DIS events coming from the high W side, which are not simulated here. This causes the mismatch between SIMC and data. Note that DIS events will not be a problem for our proposal.



- Simulations for this proposal, with the same additional smearing factor ($Q^2 = 2.1$(top) and 3.5(bottom))



  - Measurements in PR04-014 will be perpendicular settings. Hence, the cuts shown here are still a little loose.
  - We estimated the uncertainties on GE/GM assuming $f_N = 0.6$. Note that only the statistical uncertainty goes with $1/\sqrt{f_N}$, hence will be improved by $(\sqrt{0.6} - \sqrt{0.5})/\sqrt{0.5} \approx 10\%$. This will give an about 4% (relative) improvement in the final G_E^p/G_M^p uncertainties, for both Q^2 points.