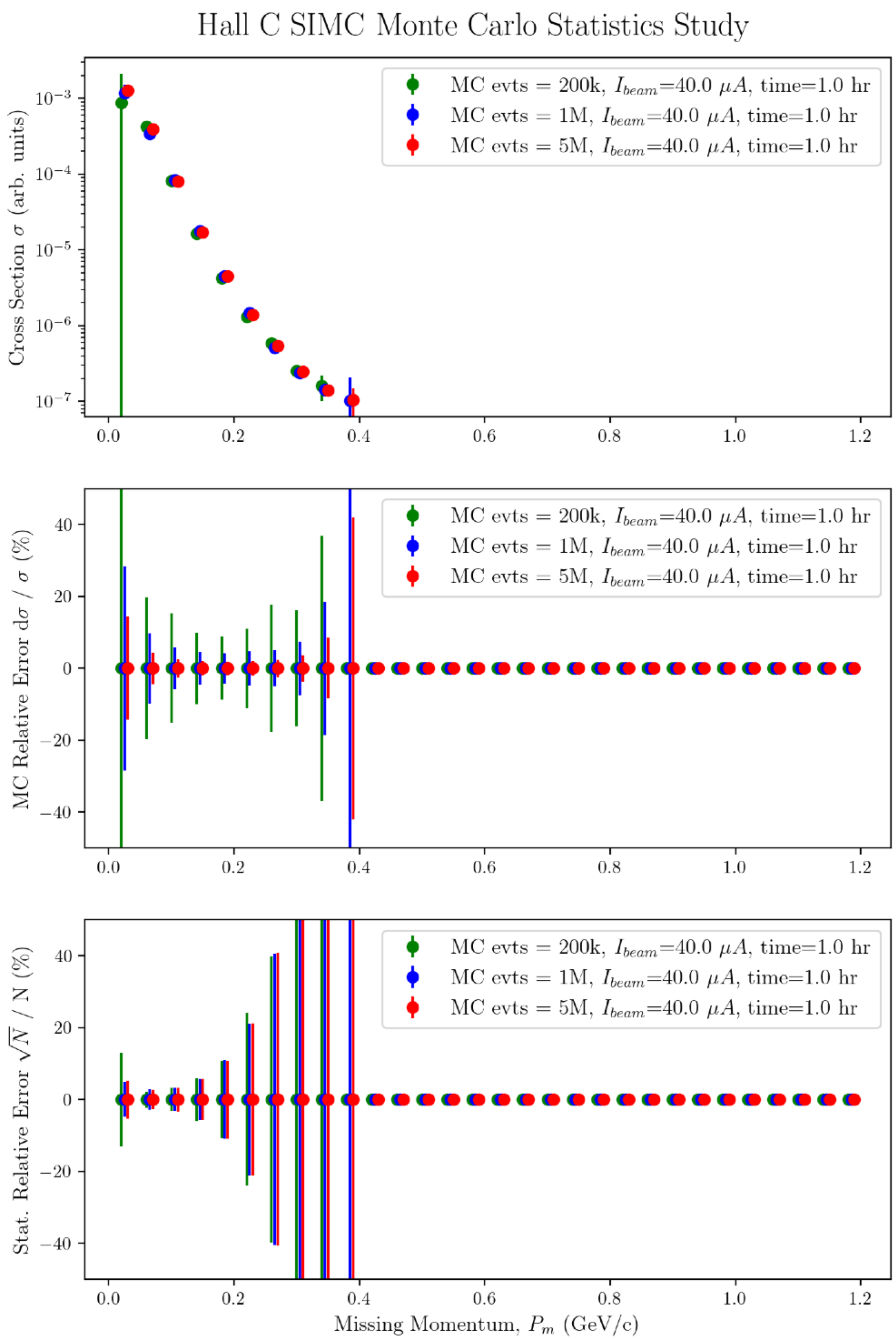


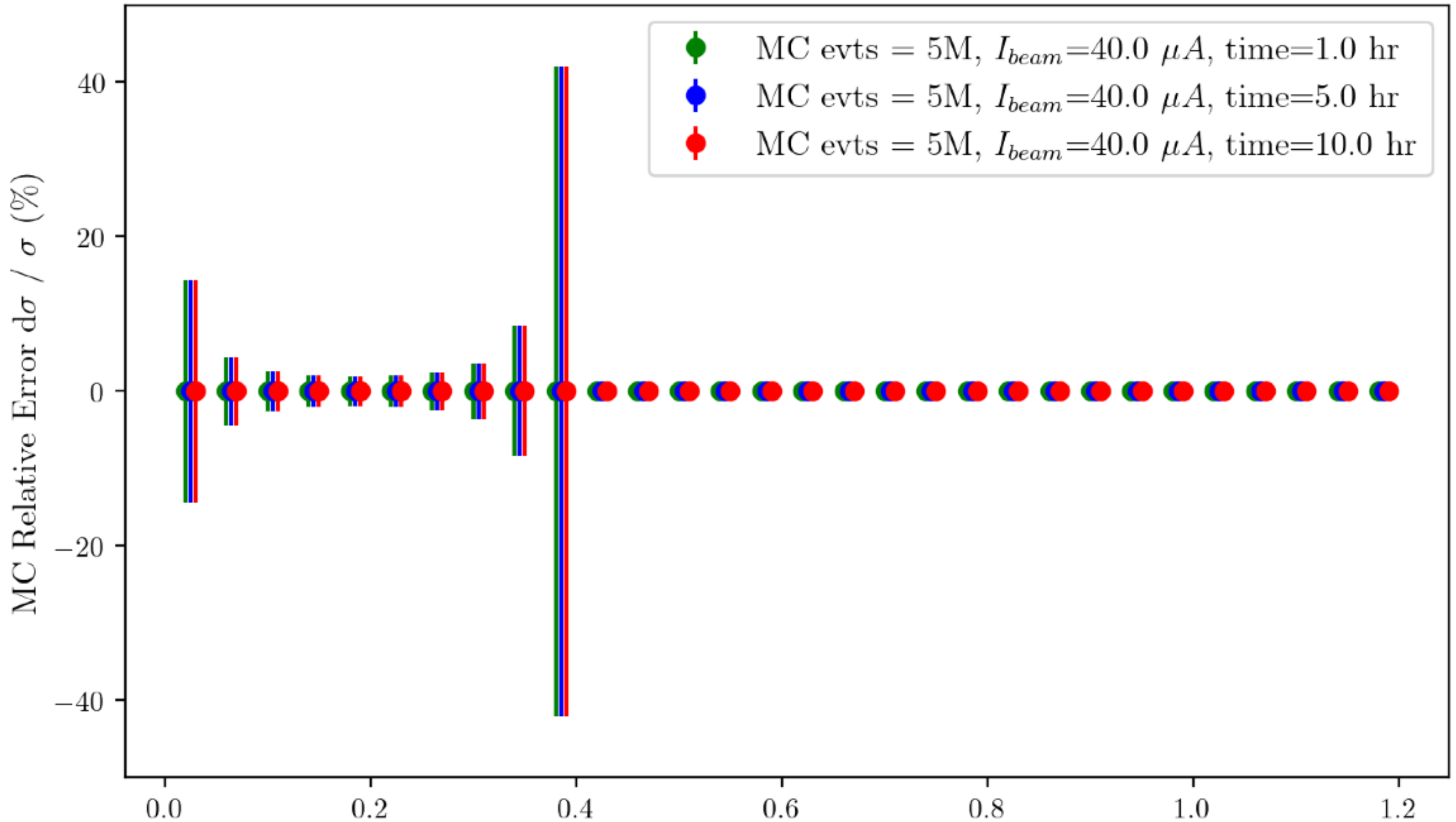
SIMC Monte Carlo (MC) D(e,e'p)n cross sections for 120 MeV/c setting using JM Laget FSI model, assuming 40 uA beam current and 1 hr of beam time. This is done for MC accepted events: 200k (thousand), 1M (million) and 5M (million)
The data points have been offset by ~ MeV/c on x-axis for ease of comparison

The errors are calculated using the sum of the weights squared of the MC statistics (**NOTE** this is different from the expected experimental statistical uncertainty)

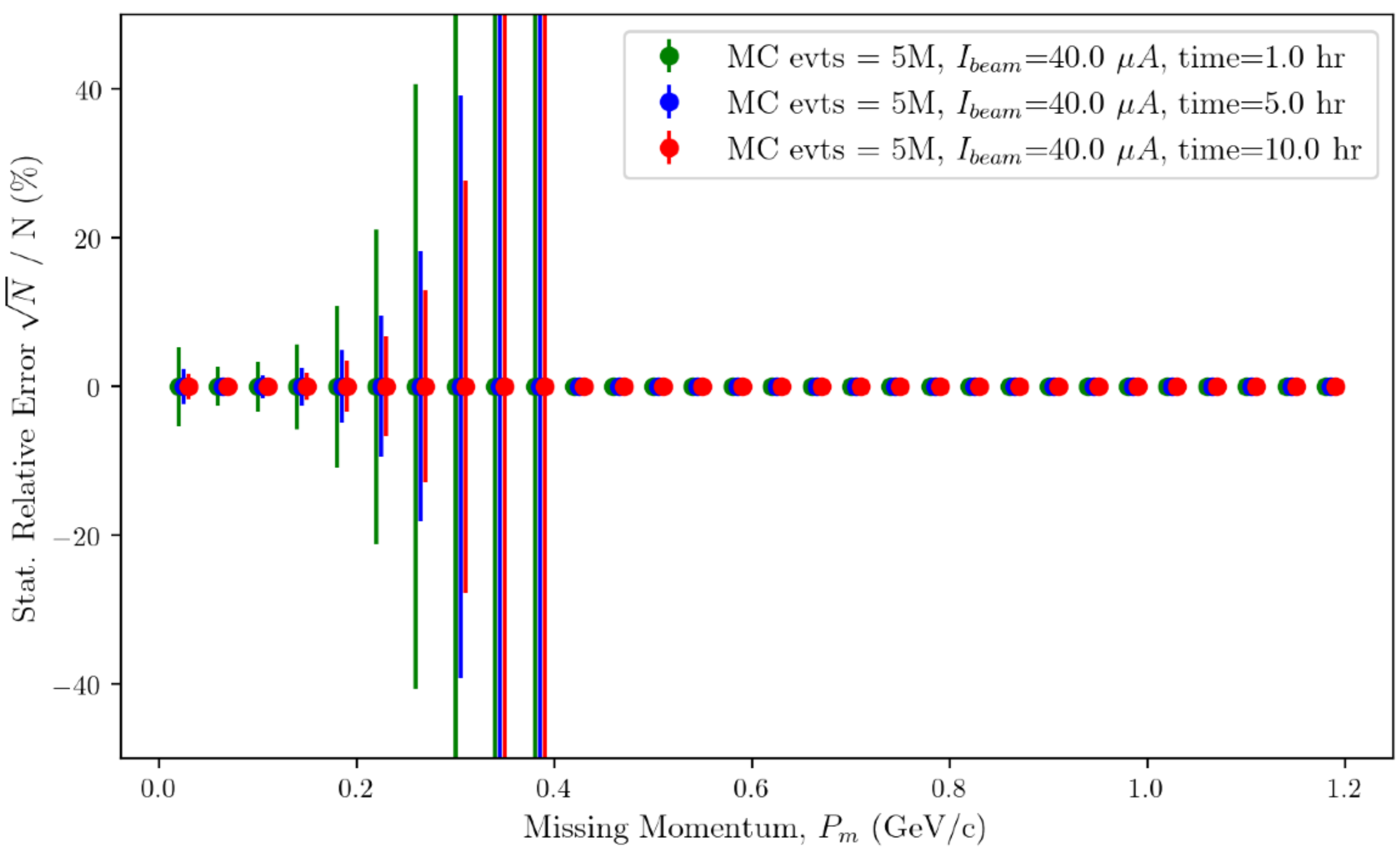
The MC cross section relative errors here are calculated as the ratio of the cross section error to the data point on the top plot. This plot shows that even though the charge factor (current * time) remains the same, the relative errors actually improve dramatically as the number of MC events increases from 200k to 1M to 5M, which demonstrates that this is **NOT** the true experimental statistics, but actually it is the MC generator statistics.

The relative errors here are calculated using the simple statistics counting relation, $\sigma \sim \frac{\sqrt{N}}{N}$, where N is the weighted counts per missing momentum bin (after applying kinematics and acceptance cuts). This plot shows that the relative errors are independent of the MC events accepted. These are the real estimates of the experimental statistical uncertainty, as one does NOT expect the exp. statistical uncertainties to depend on t the number of MC events accepted.

Hall C SIMC Monte Carlo Statistics Dependence on Charge Factor



The SIMC MC D(e,e’p)n cross section relative errors are plotted for fixed number of MC events (5 Million), with increasing beam time, from 1 hr (red) to 5 hrs (blue) to 10 hrs (green). These results show that these are ONLY errors associated with the number of MC events accepted, and does not depend on the charge factor, i.e., beam time and/or beam current



The relative errors here are calculated using the simple statistics counting relation, $\sigma \sim \frac{\sqrt{N}}{N}$, where N is the weighted counts per missing momentum bin (after applying kinematics and acceptance cuts). This plot shows that the relative errors are independent of the MC events accepted. The results also show that the relative error improves (decreases) with increasing beam time, which means these are truly the estimates of the experimental statistical error. These are the errors we need to calculate when making beam time estimates.