

CLAS12 Monte Carlo Production at MIT

Richard Milner



CLAS12 Collaboration Meeting

November 13, 2018

MIT Collaboration in CLAS12

Personnel

- Faculty: Or Hen and Richard Milner
- Principal Research Scientist: Douglas Hasell
- Postdoctoral Researchers: Axel Schmidt
- Graduate students

Science Focus

- NN Correlations in Nuclei
- DVCS and Imaging

Technical Contributions

- Back Angle Neutron Detector
- Analysis
- Monte Carlo Simulation



Computing Resources at MIT

Massachusetts Green High Performance Computing Center (MGHPCC)

- located in Holyoke in western Massachusetts
- 68 dedicated MIT racks, each capable of 25 kW cooled power
- various MIT users and groups (*i.e.* competition)

High Performance Research Computing Facility

- MIT-Bates Research and Engineering Center, Middleton, MA
- 71 water-cooled racks, each capable of 12 kW of cooled power
- 100 Gb/s link from MIT campus to JLab
- 32 racks assigned for CMS Tier-2 (24 in use)
- various other users (earth science, *etc.*)

Two other large scale, computer clusters (no experience using)

- OC11 - 60 MIT racks near Downtown Crossing in Boston
- W91 - 40 racks on MIT campus



Initial Estimates of CLAS12 Monte Carlo Requirements

5 PB of simulated data corresponding to 28 week run in 2019

- estimated at 500 dual processor Intel Xeon E5-2697v4 CPUs
- production to match 28 week timeline

Corresponds to 30-50% of capacity at Holyoke or $\sim 50\%$ at Bates

- very unlikely that we would be granted this much capacity
- possible to stage over longer time frame
 - one week per month \Rightarrow 2 years
 - continuous running at 10% capacity \Rightarrow 2 years

Virtual computer center *subMIT* connecting Bates, Holyoke, and OSG

- might be manageable in 1 year

Reduce or simplify CLAS12 requirements ?



MIT Proposal to Support CLAS12 Monte Carlo Production

Hire post-doc at MIT to coordinate and supervise production

- coordinate with CLAS12 Monte Carlo convenors
- define priorities, physics processes, models, *etc.*
- MIT post-doc submits and monitors jobs locally

Need to benchmark a test data set at MIT ASAP !

Request support from DOE

- 200 TB file server at MIT-LNS computer services (50k\$)
 - collects Monte Carlo data from production centres
 - serves as staging area for verification, organisation, and distribution
 - transfer to JLab (300 MB/s → 200 days for 5 PB)
- some financial support for LNS computer services personnel
- commit to ongoing MC production for several years

