Report Title: ERCAP Requests Details
Run Date and Time: 2018-10-09 07:37:08 Pacific Daylight Time
Run By: PDF Generator User
Table name: u_ercap_requests

ERCAP Requests

This request is a renewal.:	true		
ERCAP Number of Request to Renew:	ERCAP0007866		
ERCAP Number:	ERCAP0010622	Allocation Year:	2019
Project Title:	Analysis and Simulation for the GlueX Detector	State:	Draft
		Revisions required:	
Short Project Name:	GlueX	Rejection Reason:	
PI Name:	Lawrence, David (davidl)	Project Class:	DOE Mission Science
PI Name Company:		DOE Office and Program:	NP - Nuclear Physics
PI Name Email:		Sub Program:	NP - Accelerator Physics
PI Name Business phone:		Science Category:	Physics : NP (Experment)

Personnel

Sponsoring Organization:

Jefferson Lab

Senior Investigators:

Mark Ito
David Lawrence
Alexander Austregeslio
Thomas Britton

Authorized Preparers:

Lawrence, David (davidl), Watson, Chip (cwatson), Larrieu, Christopher (larrieu)

Funding

DOE Office of Science (DOE/SC):

true

DOE Funding Source:

DOE Office of Science Nuclear Physics (NP)

DOE Program Manager:

Fai, George (gfai)

List DOE/SC Grant, PAMS, FWP numbers:

This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics under contract DE-AC05-06OR23177

Federal Agency other than DOE/SC:

false

Other Funding/Agency Source(s):

List Other Federal Agency and funding numbers:

University or other non-profit organization:

false

List universities that apply including funding type:

State or local government agency, or a foreign government:

false

List governments that apply:

Private company or some other entity:

false

List other entities that apply:

Do you work at a federal agency or national lab funded by an operating contract?:

false

List the agency and/or laboratory and contract number:

Describe the project's relevance to the DOE Office of Science mission:	

Security

Classified or controlled military or defense information:	false	Export controlled or ITAR (International Traffic in Arms Regulations) info:	false
Personally identifiable information:	false	Protected health information:	false
Proprietary information:	false	No Sensitive Information:	true

Please Explain Sensitive Information:

Project Details

Project Summary and Goals:

The primary project goal will be to analyze data taken with the GlueX detector from a set of ongoing nuclear physics experiments at the Jefferson Lab accelerator. The analysis will consist of extracting timing and energy deposition information from the data in order to reconstruct individual particle interaction events. The analysis will produce the momentum, direction, and type (particle ID) of each particle detected in each reaction. The statistics of these reaction particles can then be used to measure fundamental physical properties of the excited states of the target + photon system, leading to an understanding of the underlying particles (quarks and gluons) and the forces among them.

A secondary project goal will be to perform simulation of the experiment using software based on the GEANT4 simulation software package. Simulation is required for proper interpretation of the experimental data. We plan to explore the feasibility of doing simulation at NERSC as an alternative to other sites. This allocation request includes only minimal resources for this testing.

Project Description for DOE Managers:

We plan to perform the first stage reconstruction of the data from the GlueX experiment at NERSC. This will require transferring the raw experimental data from JLab to NERSC, producing the "data summary tapes" (DST) files, and transporting them back to JLab for further analysis. Our current plan is to try and focus larger scale full passes over the data at NERSC allowing us to use our time on the local JLab cluster for the smaller campaigns that require quick turn around. The NERSC jobs will do the most CPU intensive part of the analysis. Specifically, charged particle tracking, calorimeter cluster finding, and matching reconstructed objects between detectors.

We would also like to use a tiny fraction of the allocation to test the feasibility of running siulation at NERSC. We are currently utilizing the OSG as our primary resource for simulation. However, if the OSG is unable to support future needs, we would like to have the mechanism in place to utilize NERSC as part of a future allocation request.

Website URL:

https://halldweb.jlab.org/wiki/index.php/GlueX_Project_Overviews

Accomplishments Summary:

In 2018 we successfully executed a "monitoring" pass of the Spring 2018 data set. This consisted of ~4.3% of the full data set and is used to validate calibrations and reconstruction software. This time was also used to develop the swif2 system to implement a job workflow that couples the JLab tape library (for raw data) and NERSC. A report on the initial run can be see here:
https://halldweb.jlab.org/doc-public/DocDB/ShowDocument?docid=3793

Refereed Publications:

N/A

Non-refereed materials:

Resources

Computational Repo:	m3120	Hours Used:	5,611,068
		Hours Requested:	112,000,000
		Scratch Space Requested (TB):	60

Archive Repo:	m3120	Archival Storage Used (TB):	0
		Archival Storage Requested (TB):	1
Current Project Storage Quota (TB):	1	Project Storage Used (TB):	0.042
		Project Storage Requested (TB):	1

Brief Justification for Requested Resources:

Estimate was based on:
1. prior experience with processing a monitoring launch at NERSC for subset of Spring 2018 data
2. known amount of Spring 2018 data
3. anticipated data from Fall 2018 and Spring 2019 runs.

Some details can be seen here:

https://halldweb.jlab.org/doc-public/DocDB/ShowDocument?docid=3793

Key Events or Deadlines:

We expect a few major campaigns, each using about 34M hours and lasting about 5 weeks. These will be spread throughout the year. Precise scheduling is difficult since it depends on numerous factors that include calibration and reconstruction code verification.

Do you need real-time computing?:

false

Explanation for Realtime Computing Needs:

Experimental or Observational project?:

true

Special Requirements:

This project is a series of experiments that will be ongoing for several years. We plan to resubmit each year pending successful use of the NERSC facility.

Codes

Please tell us about your most used/important codes (select up to 5):

2

Code 1 Name:

JANA

Code 1 URL:

https://www.jlab.org/JANA/

Code 1 Description:

GlueX data analysis

Code 2 Name:

GEANT-4

Code 2 URL:

http://geant4.cern.ch

Code 2 Description:

Detector simulation

Code 3 Name:

Code 3 URL:

Code 3 Description:

Code 4 Name:

Code 4 URL:

Code 4 Description:

Code 5 Name:

Code 5 URL:

Code 5 Description:

Supporting Information

Other HPC Support:

Jefferson Lab SciComp cluster (8k-10k cores)
OSG - focused on simulation

Additional Information:

JLab is in the processes of increasing bandwidth to ESnet. This is being done in stages with the first stage (10Gbps -> 20Gbps) anticipated during the coming months. A larger increase is planned for 2020, pending successful use of NERSC which is a main driver for the increase.

Feedback:

Usage Agreement

Usage Agreement Initials:

DL

Award Information

Approval State:

Not Yet Requested

Hours Awarded:

Archival Storage Awarded (TB):

1

Project Storage Awarded (TB):

20

Approver:

Award Status:

Draft

Record History

Computational Allocation Type:	DOEMISS	Archive Allocation Type:	DOEMISS
Computational Current Allocation (HR):	50,000,000	Archival Current Quota (TB):	1
Computational Repo ID:	61032	Archival Repo ID:	61033
Computational Resource ID:	1004	Archival Resource ID:	1006
Project Directory Repo:		Renewed by ERCAP Request:	
Project Directory Repo ID:		Program Manager (historical):	
Project Directory Resource ID:			
NIM Project ID:	61031		

Related List Title: Attachment List
Table name: sys_attachment
Query Condition: Table name = u_ercap_requests AND Table sys ID = 2fd9d689db0da740200f7d321f961931
Sort Order: None

Value of property 'glide.pdf.max_columns' must be less or equal than 25. Default column number applied

Value of property 'glide.pdf.max_rows' must be less or equal than 5,000. Default max row number applied (1,000)

2 Attachments

File name	Content type	Created	Created by
ERCAP0010622 Export(2018-10-08 14:09:31).pdf	application/pdf	2018-10-08 07:09:33	davidl

File name	Content type	Created	Created by
ERCAP0010622 Export(2018-10-09 14:36:20).pdf	application/pdf	2018-10-09 07:36:22	davidl