**Response to ERR Charge**

1. **What are the running conditions for the experiment? Please state clearly the target and beamline configurations and operation.**

We run with GlueX in standard configuration using the standard diamond radiator with the coherent peak at approximately 9 GeV (energy range 8.4 - 9.1 GeV), but we also note that we are flexible to run at somewhat lower energy and are not as precisely sensitive to the machine energy. We run at x2 lower luminosity than standard GlueX with 2x107 photons/s flux. We plan to first run carbon for 7 days + 1 day to change to 4He (with heat shield) + 1 day running on 4He + 2 shifts to change to deuterium target + 5 days on deuterium including empty target calibration running.

1. **What is the operational status/performance requirements of the target system needed by the experiment? If not completed, what are the completion/commissioning schedules, tasks and user commitment?**

We will run with a 30 cm-long cell that has a copper heat shield installed around the outside for both the deuterium and 4He running (both ~4% radiation length). We will run a multi-foil carbon foil target in total 7% radiation length.

Follow-up: Check with Chris if 4He density known at couple %-level….is this acceptable for us? Do we need to plan for Compton calibration? Multi-foil C target.

1. **Has the spectrometer, detector configuration been defined, including ownership, maintenance and control during beam operations?**

Spectrometer and detectors will be in standard in GlueX configuration. Detector support will come from Hall D staff members and responsible parties have confirmed (see <https://halldweb.jlab.org/level-1/manpower.pdf>).

1. **What is the impact of the expected neutron radiation on GlueX detector components such as the SiPMs? Is any local shielding required? Are the radiation levels expected to be generated in the hall acceptable?**

We will install some extra neutron detectors in the Hall. If rates become unacceptable, we will reduce luminosity. This is primarily a concern with the deuterium target. We will show in the calculations that we don’t expect any issues. We will begin with carbon to check rates. If it is a problem to run on deuterium, we can reduce current or skip and go to 4He.

Follow-up: Pavel Degtiarenko helped with PrimEx and has some experience with the He target backgrounds and FLUKA simulations. We run at about x4 higher rate. Needs to be addressed in RSAD.

1. **What is the expected data rate for the experiments?**

Nominal GlueX trigger rate at a photon flux of 5x107 photons/s, is a trigger rate of about 80 kHz, 90% live time, and a corresponding data rate of 1.1 GB/s. For our experiment, we will lower the ECAL and BCAL thresholds so that we are sensitive to minimum ionizing particles, and we will include the start counter in the trigger. This configuration was tested in Feb 2020 (see https://halldweb.jlab.org/level-1/src) with the 5x107 photon flux. This yields a trigger rate of 68 kHz, 90-93% live time, and a corresponding data rate of approximately 1 GB/s. Our experiment will run with a photon flux of 2x107, but our carbon target will be double the radiation lengths of the nominal hydrogen GlueX target. We expect that the hadronic backgrounds from the nuclear target will be smaller due to attenuation effects and the electromagnetic backgrounds should scale with the radiation length.

Follow-up: Is this sufficient?

1. **Are the responsibilities for carrying out each job identified, and are the manpower and other resources necessary to complete them on time in place?**

We have adequate manpower from our group to cover shifts, calibrations, and analyses (TAU/MIT/ODU/GWU). We invite the GlueX collaboration to join in shifts and analysis.

1. **Are the beam commissioning procedures and machine protection systems sufficiently defined for this stage?**

Yes. This is all standard GlueX calibration and procedures. All basic calibrations done with PrimEx prior to start of experiment.

1. **What is the simulation and data analysis software status for the experiment? Has readiness for expedient analysis of the data been demonstrated? What is the projected timeline for the first publication?**

We will use standard GlueX calibration and software, and analysis will be completed within the GlueX framework. Our group already has a dedicated generator to First publication anticipated to be within a year. Group has abundance of experience analyzing short range correlations with electron beams in other experiments and a strong track record for early publications. The strategy is to first analyze channels for np-dominance:

* γ + p → π0 + p and γ + n → π- + p: 2 particle final state, lowest cross section
* γ + p → ρ0 + p and γ + n → ρ- + p: 3 particle final state, highest cross section
1. **What is the status of the specific documentation and procedures (COO, ESAD, RSAD, ERG, OSP’s, operation manuals, etc.) to run the experiments?**

Follow-up: We need assigned Physics Division Liasion to work with us to get initial documents together for approval.