The Detector Proposal Advisory Panel is beginning deliberations and we had a few questions. We are asking the same set of questions to each of the 3 proto-collaborations. Please send your answers in slide format to Haiyan Gao (hgao@bnl.gov) and Bob McKeown (bmck@jlab.org) with a copy to Tom Ludlam, (ludlam@bnl.gov) at your earliest convenience, but no later than Sunday, January 16.

We understand that you may not be able to answer every question fully in this time period, but we very much appreciate your responses and they will help us come to a wise decision. Please reference the question number in your response.

There will a second set of questions from the Detector Advisory Committee (DAC). The answers to the DAC questions will be required on an earlier timescale.

Physics Performance (T/G/P)

Note for the physics performance questions (T/G/P): some of the information requested here is already given in your proposal or in supplemental material, or in replies to our questions during the meeting. Nevertheless, we ask you to provide this information again in a concise and aggregate form, to help us in comparing the different detector concepts on an equal footing.

- Please give sufficient detail about the simulation/analysis chain, so that the committee knows which effects are taken into account and which ones are not.
- Where appropriate, specify which backgrounds are considered.
- Specify which elements of detector support/services are included in the simulation.

Technical aspects of physics performance (T):

T-1: Provide some details on how detector calibration will be done.

T-2: Can the physics performance be optimized by adjusting the field strength of the spectrometer magnet to the beam energies of different runs?

T-3: What happens to the physics performance if AC-LGADs have to be replaced by something else (e.g. LGADs)?

T-4: What happens to the physics performance if C2F6 and C4F10 cannot be used? Have you considered using alternative gases for the initial design rather than as a later modification?

T-5: What happens to the physics performance if you need to use lead glass instead of SciGlass?

T-6: How will radiation damage of detector components affect physics performance, including forward and backward instrumentation? Please provide a map of the radiation field in the detector.

General physics performance of the detector (G):

G-1: What is the physics impact of not meeting the Yellow Report (YR) tracking requirements at negative eta?

G-2: pi- vs. e- rejection:
Provide plots for the pion rejection factor and for the remaining pi contamination for the combined effects of all sources of discrimination. The plots should be as a function of the momentum p for the eta bins [-3.5, -2], [-2, -1], [-1, 1] (cf. Table 3.1 of the YR).

G-3: hadronic jets:
Provide estimates for the jet energy scale and for the resolution in jet energy and angle. This should be shown as a function of jet energy for different regions of pseudorapidity (central, forward, backward).

G-4: charm tagging:
Provide estimates for charm acceptance, efficiency, and purity in different regions of pseudorapidity. Which are your expectations for measuring charm cross sections in addition to asymmetries?

G-5: charged pion vs. muon rejection:
Provide estimates of the pi/mu rejection factor in different regions of pseudorapidity (central, forward, backward).

G-6: backward instrumentation:
Provide some detail on how you estimate the accuracy of the luminosity measurement.

G7: tagged photoproduction:
Provide some details about the acceptance and resolution in Q2 and energy for electrons scattered at very low angles.

Projections for full physics processes (P):

P-1: diffractive electroproduction of J/Psi on nuclei.
e Pb -> e J/Psi + Pb and e Pb -> e J/Psi + X
Plot of the cross section vs t for the coherent and the incoherent process with the following settings (cf Figures 7.83 in the YR and 3.23 in the WP):

- 1 GeV^2 < Q^2 < 10 GeV^2
- x_V < 0.01 with x_V = (Q^2 + MJPsi^2) / W^2
- integrated luminosity 10 fb^{-1} / A
- beam energies 18 GeV on 110 GeV/A

Please indicate statistical and total errors separately. (e.g. by inner bars for statistical errors). If within the possibilities of your detector, provide separate plots for using the e+e- and the mu+mu- decay channels.

P-2: DVCS on the proton
Plot of the cross section for e p -> e p gamma vs. t with

- 10 GeV^2 < Q^2 < 15 GeV^2
- 0.004 < xB < 0.006
- integrated luminosity 10 fb^{-1}
- beam energies 18 GeV on 275 GeV

Please indicate statistical and total errors separately (e.g. by inner bars for statistical errors).

Collaboration, Management, and Organization (C):

C-1: What are your plans for incorporating engineering and other technical effort into the project?

C-2: How are you evaluating that the groups taking responsibility for detector systems and their subsystems have the technical capability necessary to successfully execute the tasks?

Overall Experiment Design (O):

O-1: What staging scenarios are available, if staging were to become necessary?

O-2: Describe the accessibility of your detector systems and their electronics for urgent interventions and for annual maintenance. How long does urgent access to detector components and electronics require during beam operations? Are there any detectors or electronics that are not accessible even during annual maintenance periods?

Electronics, DAQ, Offline

E-1: Identify the main uncertainties/risks/challenges in implementing full streaming readout with the proposed sub-detector technologies and DAQ system concept.

E-2: At what point in the readout chain from detector to recorded data do electronic components change from being detector-specific to using common solutions shared by all detector systems?

E-3: At what point in the data acquisition does software (and firmware) become common for all readout chains? Which hardware and software for control, configuration, and timing are common for all detectors?

E-4: To what extent are offline algorithms foreseen to be used in the online system, and in which part(s) of the readout/DAQ system?

E-5: Within your proposed DAQ/computing model, at what point will online calibration be required? Describe a high-level strategy for online calibration, and significant technical considerations in achieving this.

E-6: Describe how the development of the readout electronics for different sub-detectors will be centrally coordinated.