Users Group Board of Directors Meeting
Jefferson Lab, December 11, 2009

Present: Andrei Afanasev, Ron Gilman, Zein-Eddine Meziani, Katherine Myers, Ioanna Niculescu, Patricia Solvignon
Not present: Phil Cole, Paul Eugenio, Nilanga Liyanage, Franck Sabatie.

Larry Cardman: *Where we are in completing 6 GeV, and where we are in planning for scientific prioritization of 12 GeV*
The priorities in determining the schedule for the final years of 6 GeV running were to honor previous commitments, to run the Hall A parity program in FY10 (now), and to run Qweak in FY11-12. These parity experiments drive the setting of beam energies. Constraints from budgets, including equipment funding, remain uncertainties in the out years.

In FY09, the laboratory did get funding and have a spring run in Halls A and B completed successfully. Hall C lost physics due to SANE target issues. We are now in a mode where we cannot let the schedule slip, due to 12 GeV deadlines, unlike in previous years. We have recently decided that we have funding for the needed HDICE and Hall A DVCS equipment needed for these experiments in the coming year.

For FY10, the laboratory in the end got funding at essentially the president's level – it got the operating budget requested despite NP funding pressures. The laboratory expects to complete the Hall A parity experiments, the eg6 and FROST experiments in Hall B, and start Qweak in Hall C.

There remain questions about equipment funding for installation of the g2p experiment (and form factor and hypernuclear experiments) in Hall A and the e+e- experiment in Hall B, as well as the out year operating budgets. It is likely if there is a shortfall of money that the lab will do its best to run the machine, but if there is not enough money for equipment / major installations then beam time will go towards lower resource experiments. A detailed budget for FY10 should be available soon. The situation for FY11-12 remains ambiguous. A first glimpse of operations funding should be in February 2010 with the proposed budget. Construction money for 12 GeV is still to be determined.

Things are going well now. In summary: broadly the program is progressing well. But Hall B experiment group eg6 is likely to end up with less than its full beam time.

Larry was asked about the determination of beam polarization. Happex-III made the case that they needed longitudinal polarization, and got it, but PVDIS did not. PREX is to be determined. Qweak will be fixed later.

Larry was asked about changes, particularly last minute changes, to the schedule. The initial schedule gets set okay, but apparently some changes opaque and unfortunate at last minute. The Laboratory expects Hall leaders will properly represent experiments with respect to last minute changes. The Laboratory has not done details as well recently, due to overload. It is working on future details now. There are last minute daily issues, which is the point of the daily meeting.

Zein-Eddine suggests that Hall leaders need to be more aware of experiment needs.

Larry states that beam requirements submitted by experiments are used to define the schedule. Things will never be perfect.

Ron asks about Qweak requirements. Larry says that cryopower can be satisfied for all 3 halls, through enthalpy recovery and shutting down FEL. Beam polarization needs to be checked. Limits on the amount of transverse polarization to Qweak have not been set.

Zein-Eddine asks about the prospects for the g2p experiment in Hall A, which is being led by young physicists. Larry suggests the collaboration meet with Mont. They will need to get engineering and construction money in the coming year. Mont has been clear that delivering beam time is a priority ahead of a single experiment.

Larry turns to the topic of the 12 GeV scheduling. The procedure is basically imitating the 4 GeV start up in the mid 1990s. Then, as now, many proposals were accepted, and then rated in the end by a series of PACs. At the start of 4 GeV, the rating was done Hall by Hall in 3 successive PACs. After discussing this with board, the laboratory will have the PAC rate the experiments by science category. Having the PAC look at program by science category several years ago was useful, so it is natural to have PAC rate science program for 12 GeV this way.

The first category is transverse structure of nucleon, largely form factors. A message has been sent to spokespersons of these proposals already. The experiments are to submit brief written updates, updating the science and reporting technical progress. At the PAC the experiments will be able to show 3 view graphs, one on the scientific case, one showing anticipated data, and one on anything else felt to be relevant or important. Conditionally approved proposals in this area might be considered for rating if updates are submitted, but updates are not required at this time.

Conditionally approved proposals have scientific rights for 1 year / 2 PACs. Current conditional proposals can stay in category no longer than the PAC that rates those proposals.

Proposal that have not made it through the PAC do not get rated. At future PACs, all newly approved proposals in already rated categories get rated immediately.

As an example, the Hall C 12-GeV Gep experiment is conditionally approved, and will need to do standard presentation to the PAC to get approved before being rated; it cannot do a three viewgraph presentation.

Zein Eddine mentions that there has been some negative feedback – why was the notice so late. The nature of the process is accepted, but the timing was not enough. Could it have been put off?

Larry notes two reasons to start rating experiments now: First, at 1 PAC / year, we need to have started already to finish in time; we are running late. Second, we needed the “form factor” category as a straightforward, easiest category, and there are questions about the distribution of experiments and desirability of constructing the SuperBigBite spectrometer (SBB), which impact DOE budgets, so we need a scientific rating now. SBB was going to be an Italian + NSF + some DOE project, but NSF decided not to fund it due to ambiguities about the scientific merits and uncertainties on DOE's part.

Asked about the possible impact of a new few million dollar project on the laboratory budget, and on other possible projects, Larry replies that anytime we ask for a few million it might impact the JLab budget, but lab has gotten its fair share of extra projects in the past. He doubts that SBB will affect the Moller experiment, since the two have very different cost scales.

The laboratory is contemplating a Hall B run group prioritization. Right now prioritization is done at

the experiment level, there is none at the run group level.

The laboratory is planning, like with the start of 4 GeV, to have a commissioning schedule before the scientific priority driven schedule. During the commissioning time, experiments would run at standard energies to make scheduling easier, and experiments will be scheduled in sequence with transitions determined by experiments achieving scientific goals, since running efficiency is hard to estimate for the new equipment and accelerator. Halls will present startup plan to PAC ~1 year before they start running.

The laboratory is wondering if, for the proposals being rated, one individual should present all view graphs, or if spokespeople should have 5 minutes each. The Board thinks the spokespeople should be allowed to speak for themselves.

Allison Lung: *12 GeV*
Progress is rated by awarding of contracts, and there is now a lot of visible construction around the laboratory. There are accelerator contracts awarded for cryomodules, magnets, and cryogenics. In physics, there are contracts for the Hall D barrel calorimeter, the CLAS torus and solenoid, and the SHMS Q1. More contracts are coming, including with universities for detectors – the strongest area of user involvement. Overall the project is behind construction schedule for detectors, in part because superconducting magnet contracts have required more than expected effort, and in part because money did not show in October '08 but in March '09, and some design decisions were not made. There is also excellent progress with NSF MRIs in Halls B and C.

Siding of the new helium refrigerator building has turned out to be a problem. Apparently old standard style is now exotic as old vendors are no longer around.

Hall D construction was going well. Then an outside survey crew got the floor slab wrong in one corner of the building by 2-3", leading to the question of whether it needed to be redone. The architecture / engineering firm found they has miscalculated earlier and a thicker floor slab was needed for float factor during construction. So all the floor pad has been ripped out, a new design done, another firm reviewed the design, and 6" more needs to be excavated. But there have been record rains since then. We should soon be able to get back to where we were in September. The construction is now two months behind, and we cannot stage Hall D detectors until the building shell is ready. But the "silver lining" is that the survey mistake led to finding a problem earlier that would have led to worse delays.

Zein-Eddine as who pays for mistakes? Allison replies that this is spelled out in the contracts. Costs of ripping things out will be paid for by the contractor, while the architect / engineer will pay for the rework, except Jlab pays for raw materials. There will be negotiations about details, but at present the schedule is more of a concern to the project than the cost is.

The project got $65M in ARRA funding, along with $6M for Hall D from the state of VA. $2.2M was actually received this month, and the rest hopefully will come soon, but there are worries related to the VA budget.

DOE planned to give $22M to the project in FY10, but gave instead $20M. It is hoped that the other $2M will be restored in FY11. If this is delayed a few years, and the VA money is lost, it will delay some detector procurements.

The ARRA money is being spent on accelerator and civil construction, and allows accelerated

construction of new cryomodules, with up to 5 installed and commissioned by end of 6 month shutdown, roughly 1 year earlier than previously planned, allowing earlier testing. The dates for CD4 are unchanged. Various minor work has been moved earlier, plus more major work is now planned for the 2011 shutdowns. A detailed study of the impact of earlier 12 GeV installation on running the 6 GeV program in 2012 is being done. The goal is not to put beam delivery at risk.

The total project performance is running at 99% of cost and 97% of work done. DOE is concerned with the downward trend in work done as of September, and a new review is scheduled for next April. Staffing levels have slowed progress. Recently four new staff (including Glenn Young, Physics, and Eugene Chudakov, hall D) have arrived, but Rolf Ent was lost to the laboratory EIC effort. The laboratory needs ~100 FTEs paid for by 12 GeV funds to balance budget, but right now only ~75 FTEs are supported by 12 GeV. Discussions are going on within the lab about shifting people. The lab wants to have a clear upward trend by January and February for the review in April.

The effort in Hall B to get detectors and DAQ to construction needs scientists, but Hall B has no additional staff for its added 12 GeV work, so it needs users to help more on 6 GeV operations so staff can work on 12 GeV. Hall D need more collaborators. Two new North Carolina institutions have joined, more are needed.

Rolf Ent: *ELIC*

EIC workshops have been going on for over a decade. EIC appeared in the 2002 Long Range Plan (LRP), and again in the 2007 LRP. It is in the DOE 20 year plan. The EIC advisory committee met at JLab in early November.

Plans at JLab are focused now on an option called MEIC, an 11 GeV electron x 60 GeV proton machine with s = 150-2650 GeV^2, and luminosity a fewx10^34/cm^2/s. The full ELIC requires a larger ring, but allows 11 GeV x 250 GeV, and luminosity of ~10^35/cm^2/s.

The physics goals of EIC change the focus from the 3 quark valence physics with x > 0.1 to many body systems at low x. The choice of parameters for MEIC was to be in about the same regime as HERMES, s=51 GeV^2, and COMPASS, s=340 GeV^2.

Workshops are being organized.
Ron asks Larry at what level the laboratory will be supporting the workshops. Larry responds that $5000 is the standard level of workshop support. JLab money can support certain things like registration fee waivers and travel, but not other things, like alcohol.

Rolf indicates that the goals of the workshops are to help generate input for the long range plan, starting out with white papers. There should be presentations at the next Users Group meeting. The workshop organizers have been informed about the plan by Larry, Zein-Eddine, and Rolf, and the users will need to be notified next. People should also participate in the fall 2010 Institute for Nuclear Theory program, mid September → mid November.
It is expected for the next long range plan that there will be recommendations for starting 12 GeV operations, building FRIB, and starting DUSEL; the goal is to get a numbered recommendation for EIC.

The EIC detector cartoon is being moved to GEANT4.

Zein-Eddine asks what is the feedback from the JSA Science Meeting concerning EIC?
Rolf says that they were globally impressed by strategic planning and progress over last 1-2 years. The science case needs more development. There are concerns about the science vs. the price tag. User workshops are a good thing and the collaborative effort with Brookhaven is at the right level. We should develop our own science case and work with BNL too.

David Richards: *Theory Group*

There have been numerous theory activities recently, including an excited baryon analysis center (EBAC) review, the every four year review of theory groups, and proposals for topical collaborations. Will Detmold received an OJI award this year. The group attracts excellent postdocs, as evidenced by previous postdocs Lin moving to Washington, Wang moving to a faculty position in Beijing, Schlegel moving to Tubingen. Isgur Postdoc Bachetta took a faculty position at Pavia. Two new postdocs have joined the group, centered in lattice QCD and TMDs.

In the review of theory groups, the largest groups, based at BNL and JLab, got the most time to present their work. The JLab presentation focused on spectroscopy including EBAC plus few nucleon physics, and included beyond standard model physics. The presentation was given in September, following a 150-page proposal in July. A final report is due in January. 2% of theory group funding has been withheld, awaiting the results of review. The ratings are judged by comparisons with milestones established as part of long range plan.

EBAC is led by Harry Lee of Argonne, who works half time on the project. EBAC has good description of world πN data. A meeting was held on resonance extraction. There is a planned meeting in 2010 with the Julich-Bonn group. An internal review was held in July 2009. The review indicated excellent progress, and the need for one additional full time JLab staff scientist, to coordinate EBAC on a day to day basis, and also work on GLUEx.

JLab proposed 5 topical collaborations. These are finite-length projects intended to lead to long term benefits. Christian Weiss (JLab) was PI of a project to study partonic structure and orbital angular momentum to understand 12 GeV data. Benefits include a full time position and 2 postdoc positions. Will Detmold (W&M) led a lattice NP project, which includes a new joint theory position. The effort is related to GLUEx. Rocco Schiavilla was involved in two proposals, one on nuclear effective theory.

Various physics highlights were described. A new calculation shows the radiative width of hybrids is comparable to conventional mesons in the heavy quark sector. If true also for light quarks, this is good for GLUEx. Robert Edwards has predicted with much higher precision than previously a 1-+ exotic mass around 2.4 GeV. EBAC has shown coupled channels are very important in meson production. A single bare pole can give rise to multiple observed poles. It has to be determined if this is a universal feature of the Roper or just the result of a model. Bacchtta has done nice models of the Sivers effect. There has been much work on corrections to allow incorporation of low Q^2, high x JLab data into the CTEQ analysis. There has been a lot of work on few nucleon systems . Franz Gross has shown that the best fit to two-body data gives the correct three-body binding energy. Lattice calculations have shown that it is feasible to calculate binding energy of 3 baryon system, which is very exciting for the future. Young, Thomas *et al.* find that they can constrain cross section for super-symmetric dark matter from the Σ commutator through chiral fits to lattice calculations.

The lattice effort got $5M from ARRA to support new machines for lattice calculations. Before this

lattice support from high energy physics was about 4x nuclear physics support; now they are about equal. Money is being spent on machines with graphics processors, which are high powered floating point processors, and work is ongoing to exploit these for lattice work.

Ron asks about the effort to find a replacement for Tony Thomas. Larry says there is a short list, and discussions have begun, but he believes an offer has not yet been formally made.

Zein-Eddine mentions concerns about the EBAC report not being made public yet – but there is some confusion about whether it is the EBAC or theory review. The July EBAC review is available, but theory review is not. JLab is expecting to get the theory report in January, including the rating of the JLab theory group and the average rating of all theory groups reviewed.

Andrei suggests that with the upgrade EBAC will have to move into meson analysis as well, changing its focus. It was always the intent that over time EBAC efforts will lead into a meson analysis effort, and a name change.

Zein-Eddine asks whether having a center helps. Larry says that DOE directs money for theory and money for EBAC. JLab had asked for EBAC expansion earlier. Note that a topical center is different since they have finite lifetimes, while the EBAC effort is ongoing.

Eugene Chudakov: *Hall D*

The idea of flux tubes (Nambu 1970) leads to exotic mesons, with J^{PC} having both regular and exotic quantum numbers. The first exotic 1^{-+} state is expected with mass ~ 1.9 GeV. Photons can produce exotics without spin flip, and photon polarization allows amplitude analysis, both benefits as compared to pion beams. There is already some evidence for exotics. A 1^{-+} at 1.4 GeV is established, but the interpretation as a hybrid is ruled out. A 1^{-+} with mass 1.6 GeV could be a hybrid, but experiments are conflicting. Data has come from BELLE, BABAR, ... with JLab next, then FAIR. Other Hall D physics includes Primakoff production, charm, and cascade physics.

The scheduled beneficial occupancy date for Hall D is August 2011; Allison Lung already covered the construction issues.

The photon radiator is a 20 um diamond crystal. A narrow angle resolution of 20 microradians is needed; 10 microradians has been achieved after finding problems with holder vibrations. At 12 GeV with a 2.2 uA beam each crytal lives for a few months. The tagger has been optimized with a smaller magnet to decrease costs, with little loss in acceptance.

The spectrometer was shown and described. An ASIC amplifier for drift chambers, developed by the UPenn group, was described; production starts in 2010. The Central Drift Chamber has 3500 straws, with 150 um resolution measured with full scale prototype; CMU starts production this year. It was chosen to use straws with a thin 0.03 μm Al layer over a thicker 15 μm Al layer. These straws are less sensitive to mechanical damage, and more robust under exposure to radiation, probably since they are made with less glue. The forward drift chamber frame acts as a photon converter, decreasing the efficiency of the forward calorimeter due to magnetic field bending the e^+e^- produced. Effort has gone into developing thin frames.

The 4-m long 2-m diameter barrel calorimeter is the most expensive detector. It is a spaghetti calorimeter, with long fibers and lead sheets, ~50%-50%. Hall D is currently deciding on which photon

detector to use, which will determine segmentation. Expected resolution is ~ 5%/root(E). the fiber met specifications, with attenuation length > 300 cm, and >5 photons at the end of the fiber, for tracks in the middle. Under consideration are fine mesh phototubes or Silicon photomultipliers (SiPM), in effect a choice between ugly light guides vs. less-known devices. A decision is needed by January. Hamamatsu SiPM fulfill specs, but SenSl SiPM give too long pulses (180 ns). A radiation test of the SiPM is still needed.

Electronics involve 250 MHz flash ADCs, which are close to final, 125 MHz, 72 ch TDCs needed for the chambers are ½ done. The CTP is done.

The solenoid was inherited from SLAC / Los Alamos. Repairs of all 4 coils are almost done.

The Hall D budget comes from 12 GeV and from operations. It mostly goes to detectors, then electronics, … The collaboration has 16 universities, and remains somewhat thin. The schedule is advancing at the right rate, but has been a ~constant 2 months behind for a while. Issues include manpower and the solenoid, a Lehman review concern. Testing the solenoid will likely take until summer 2011, which is 1 year longer than expected, but eats up all float. If there is major trouble found in the testing, there is a schedule problem. In the past, shorts usually happened when the magnet was moved on long trips, but now there is only a short trip left to Hall D, so there is some confidence. Also, the magnet can run with one short, but not two.

Zein-Eddine asks if it would have been better to get a new magnet? Eugene replies that it would have been better if the original decision would have been different, but at each stage since, where this has come up, it has appeared to be too late to change the decision, and it definitely is now. The entire detector is designed to fit into this magnet.

Zein-Eddine asks about getting a spare coil. Eugene relates that the Lehman review suggested building new coils as an option. The existing coils appear to be more old coil art, rather than an industrial product.

Ron asks when the Hall D workshop will be held. Eugene responds that Christian Weiss and Curtis Meyer are discussing the date.

Zein-Eddine asks about the need for a Cerenkov for J/psi?
Eugene says that the space is there, but the detector was descoped, and it is not needed for J/psi. The detector is tuned to GLUEx, with low energy, high multiplicity final state particles. This is different from J/psi, with a few high energy particles.

Andrei Afanasev: *Experiment/theory liaison report*
Theory support of the experimental program is satisfactory. Theorists are involved in meetings, proposals, analysis, interpretation, EIC, dark matter phenomenology,... They provide reviews for the PAC and serve on the PAC. There has been user interest in 2 photon / radiative corrections, an area often viewed as too theoretical by experimentalists, but too experimental by theorists; perhaps some new mechanism needs to be set up here. EBAC perhaps needs to expand its focus to mesons, e.g., theory work on GLUEx.

The earlier discussion of EBAC/ theory review reports is reviewed.

Ioanna Niculescu: *PAC Issues*

There has been no PAC recently; the only issue that has come up concerned that the notice about grading experiments went out late. Larry responds that people were given the same time to respond to this notice. He expects to announce the schedule for ratings way before next PAC. There might be a special ratings only PAC. Depending on how many proposals are in a category, we might be able to do two areas at one PAC.

Latifa Elouadrhiri: *Women in Science*

JLab education programs generate good relations with the local community. Good public speakers are needed. Efforts go to increase the number of women, improve the quality of K-12 instruction, etc. JLab science education reaches about 1000 teachers and 10000 students annually. The BEAMS program is for students, while the ACTS program is for teachers. They are run by Jan Tyler. The lab has no official postdoc mentoring program.

Latifa notes that the CLAS graduate students and postdocs elect one person who meets with CLAS CC.

Dennis Skopik attended a DOE Gender Equity Workshop in May 2007. This led to a self organized committee, including Gail Dodge, Latifa Elouadrhiri, Hari Areti, and Dennis. There were two meetings at the lab attended by physicists and engineers. At the meetings, there was interest in improving some areas of the lab. Subsequently Mont attended a talk at the Denver APS talk by Cherry Ann Murray, and was given advice to support the group.

The lab has now set up a lactation facility in F331. People are investigating the feasibility of a child care center. Other labs - BNL, ANL, and FNAL - have them. There is a facility on Canon near the back gate – but the back gate has been closed for the past several years. JLab is looking into best practices at other labs.

The group held a JSA funded workshop. The timing was not perfect, as meeting came too late to have results ready for the next round of proposals. The Workshop had one day of talks, and ½ day of discussions. Lab management was present, along with chairs of local physics departments. The UGBoD was largely absent. There were discussions on recruiting and retaining women. Lessons included that diversity matters, environment matters, and awareness matters. Issues vary with location.

Zein-Eddine suggested that we should set up link from Users page to workshop page http://conferences.jlab.org/wsw09/, and asked what can the board do? He suggested as an idea an open house, bringing students and showing a hall. Larry said it would be okay to take a look at the schedule and identify times that are okay, but it would not work well as an extra parameter to go into the scheduling. Patricia mentioned an effort at Argonne to have two women staff and / or postdocs and / or graduate students at a table hosting 6 younger people for lunch and discussions.

Kees de Jager: *Hall A*

Hall A is generating about 5 publications/year. The parity program is ongoing now, with preparations underway for the Pb parity experiment starting in March. Hall A is on track for the scheduled installation, but scrambling to replace technical people. The Compton polarimeter has achieved 5.6 kW of locked green laser power in the cavity, 3x specifications and a world record. The two high current parity experiments run in the hall have led to radiation induced problems. For example, recently the spectrometers have been rotated manually by large teams of people. After PREX, there will be proton and neutron DVCS experiments. During the 2011 accelerator down, there is a

major installation for the g_{2p} and G_E/G_M experiments. The Hall C superconducting target magnet is under repair at Oxford, but full funding for these experiments remains under jeopardy.

The SBB spectrometer proposal is out to DOE for funding. A director's review of the MOLLER experiment is scheduled for Jan 14/15. The SOLID proposal is being resubmitted to PAC35.

Ron asks about Hall A staffing. Kees says that the start date for new postdoc Jixie Zhang has been delayed by visa issues from ODU. He hopes for a start in March. A recommendation to Larry for the Hall A staff position open is being processed.

Zein-Eddine asks about the scale of the funding for g_{2p}. There are about 600 k in expenses, about 400 k in design. Design staff are available, but their cost either goes against the 12 GeV project or against operations. From Mont's point of view, they have to be paid from one source or the other; they are not free.

Volker Burkert: *Hall B*

Hall B is generating about 12 publications/year.

This past year, EG1-DVCS ran in 3 segments. All were polarized, but were generally lower in energy than desired. Physics included DVCS on deuterium and sem-inclusive processes. Volker shows plots of the product of beam and target polarization for the proton and deuterium targets.

Currently EG6 is running, investigating meson spectroscopy and DVCS on 4He. The target has worked well, but beam delivery was difficult at first, and the experiments will probably lose ~25% of their desired statistics.

Upcoming is the g9b FROST run, 5 experiments in 1 setting, looking for missing resonances with a transversely polarized target. Later, the g14-HDICE target runs. The
HDICE building is nearing occupancy. A new cryostat is needed. There is a small 5 day Homeland Security run after FROST.

There is a lot of approved 12 GeV physics, still >500 days of run time when the experiments are combined. The toroid and solenoid magnets have been contracted out. Volker describes the 12 GeV detectors, both some technical details, and the institutions responsible.

In summary, Hall B is continuing to produce physics, critical experiments for the N* program are coming up, CLAS12 has entered the construction phase, and 5 years of physics are approved. The main issue is insufficient scientific manpower to support both 6 GeV program and 12 GeV.

Zein-Eddine asks if there is a backup for the transverse HDICE target for 12 GeV, in case it does not work with e- beam. Volker says a test is planned during 6 GeV that will determine in 2011 whether or not the transverse HDICE target works. If not, a solution will have to be worked on.

Asked about staff levels, Volker days that ~6 FTEs are needed for 4-5 years for 12 GeV. The overall size of the collaboration is about the same as before.

Steve Wood: *Hall C*

SANE is old news. Due to quench problems, SANE got ~75% of its perpendicular and a lower % of its parallel statistics. Other experiments did not run. There are attempts to get parasitic to SANE data on the proton G_E/G_M and with inclusive HMS data g_1 and g_2. It took five months to install HKS, which is similar to the hypernuclear experiment of 5 years ago. With the special new electron spectrometer from Japan and the pre-bent beam, backgrounds are cleaned up, and on line results are of the same quality as previous off line analysis – the Λ and Σ peaks are visible in online missing mass spectra.
There is also a parasitic heavy hypernuclear fission experiment mounted in the photon dump.

There was only a single Ph.D. thesis from Hall C this past year, but there are 25 thesis students with data.

Steve shows preliminary Gep-III proton form factor data, as well as π^0 photoproduction (background) data from the same experiment, compared to old Hall A Wijesooriya results. Steve also shows recent results for the EMC effect on light nuclei, showing a local density effect. The G0 backward-angle article has been submitted, but there is ongoing analysis of transverse and Δ asymmetries.

Hall C is now setting up Qweak, which will run until the shutdown. The entire beamline is being redone, with a new Compton polarimeter being installed. The cryotarget safety and readiness review was done. The Qweak magnet frame is being assembled in the hall, while the coils are in the test lab waiting. The Compton chicane is waiting at Bates as there is no room to store it. There are 10 Qweak postdocs and graduate students on site, and 1-3 sabbatical visits are expected next year. Hall C recently hired Silviu Covrig, Brad Sawatzky, and Patricia Solvignon. It as a result does not have a postdoc, but jopefully will soon. Hall C has also formed an SHMS users group.

The SHMS Q2/3 and dipole magnets were put out as package, but the bids came back too high. They are now going back out separately. Hall C is working on getting ready to take SOS out of Hall; it is believed that removing the dipole is not very difficult, but removing the shield house is. In August there was a review of SHMS detectors. University groups are starting work on detectors. Two university proposals went to funding agencies to add Aerogel detectors needed for SHMS particle identification – multiple ones needed for the SHMS momentum range.

Hugh Montgomery: *Laboratory Outlook*

The laboratory was recently visited by Steve Chu of DOE, and William Brinkman, the director of the Office of Science. Steve Koonin is expected on Dec 14. Some notable achievements this past year include a PECASE award and 0 DART cases for safety in '09. For FY09, the laboratory received total funding of about $200M, including stimulus funding. The most recent DOE S&T review of the lab last July was positive about theory, staff, visibility, publications, SRF program, etc.

The laboratory has been busy with many events recently. These include the Lehman review of 12 GeV, the 25th anniversary, testimony by Mont to the House Committee on Science and technology on Oct. 1, the Hawaii APS meeting, the Brinkman visit, the EIC-AC meeting Nov 2-3, the JLAMP proposal submitted 11/6, the Women in Science and Technology Workshop 11/16-17, a staffing plan through 2016 done 11/24, the strategic planning jamboree 12/1 (The JSA board asked to see the plan before it was submitted.), the JSA science council 12/4, etc.

The Lehmann review was an excellent review. They concluded that the construction has been well launched, and requested an updated estimate of cost to completion and paying attention to safety, and

had concerns with manpower.

The new TEDF facility construction has already started with $27M funding. It is at the CD2 stage.

Each year the laboratory does a self-assessment. This year it graded itself A or A- in all categories. Some areas are subjective.

Mont and Jerry Draayer recently had a meeting with Brinkman and others at DOE. They talked largely about staffing levels, and recruiting engineers and 12 GeV physicists.
Fulvia Pilat will be coming from BNL to become Andrew Hutton's deputy next summer.
There is progress in the searches looking for a new director for theory (a report from the committee) as well as chief scientist. They also talked about the FEL, and the need for photon scientists for FEL.

Zein-Eddine asked how you go about setting up a new machine in a new field. Mont suggested CEBAF was one example, and mentioned others.

Mont said that at present the EIC has too large a cost for a not broadly enough accepted physics program. The EIC Advisory Committee reports to the JLab and BNL lab directors. The laboratory is currently focused on a lower cost MEIC design. MEIC would provide 4 interaction regions: one for polarimetry, one for low energy with $s \sim 200$ GeV^2, and two for medium energy with $s < 2600$ GeV^2. Overseeing the effort at JLab are Zein-Eddine (ex officio) with Andrew Hutton and Larry Cardman. The local emphasis is on high luminosity. In contrast, the effort at BNL focuses on gluon saturation. The present goal is to generate white papers available at the beginning of summer 2010. The Science Council (Al Mueller, Bill Zajc) recommends that the laboratory keep collaborating with BNL, but also keep pushing for the JLab machine.

The FEL has focused on its fundamental IR harmonic, and not been upgraded in a while. The laboratory recently prepared the JLAMP proposal. The proposal uses modern cryomodules, 600 MeV, a two-pass LINAC, and would provide the highest luminosity soft x ray machine in the world. The JLAMP proposal is posted on the web site, available through http://www.jlab.org/FEL/jlamp.html, and George Neal is the contact.

In the FY10 budget the 12 GeV upgrade budget was $2M less than previously planned; this was an explicit markup from congress. There is a strong emphasis on running the next couple experiments, a focus on running. A lot has already been invested in Qweak, and we want to run it. The intent is to run in FY2010 as planned. Hall A parity violation is going well. We needed to shorten Hall B running to run HKS. 2009 has been an exciting first year, and 2010 is starting well.

Asked about the Hall A experiments needing funding for installation, Mont says that the aim is trying to maximize running, without delaying 12 GeV. Larry explains that the incremental cost of 1 week of beam time is about $150-200 k. The incremental cost of 2.5 hall running is $0.5M. There is a discussion of the possibility of the last Hall A 6 GeV experiments running. The probability is difficult to assess, since small changes in
the out year budgets make all the difference.

Mont describes further the status of the theory and deputy searches. There is supposed to be an EIC report, but it has not yet been seen. A recommendation has been received from theory committee. A candidate who appears excited is expected to visit in January. Not a done deal yet. Concerning the science deputy, Mont believe he has a good candidate who will accept when made an offer.

Patricia Solvignon: *Postdoc report*
Patricia describes a plan, related to a JSA Initiative from Karl Slifer, to have postdocs dry run the process for faculty interviews. A series of interviews is planned. Patricia is not happy about feedback page; it is not really accessible from outside. The feedback form is at http://www.jlab.org/user_resources/usergroup/board/feedback.html.

Phil Cole: *Space Issues*
In mid November a user's belongings were removed from his office in the F Wing and placed into storage to make room for a new occupant. The user was given only two days' notification through e-mail, which the user had not read while away at a conference. All agree this was unfortunate and lab management has taken corrective actions. A new procedure has been implemented that requires hall leaders to be in the chain. Such a move without proper notification is now not possible.

Nilanga Liyanage: *Running Experiments: Notes submitted for UGBoD meeting*

Hall A:

- HAPPEX-III: Experiment completed by the end of October.
    - The HAPPEX-III experiment completed is run with about two-thirds of the PAC-approved beam on target, which is very near to reaching the experimental goals. The specifications for run-averaged helicity- correlated beam asymmetries for HAPPEX-III were achieved. Beam availability averaged approximately 50% after an extended commissioning period, until the power outages brought the beam and hall down and ended the experiment a week early. Despite the early ending, we did manage to obtain all of the essential calibration data.

    - The biggest challenge in the experiment turned out to be operation of the Compton polarimeter coupled with beam quality issues. Background rates in the polarimeter were high for much of the run, with instabilities in the injector making it very difficult to tune and maintain stable beam with suitably low Compton background rates. Accelerator personnel worked very hard to achieve usable rates, and the collaboration appreciates their efforts.
- PVDIS (E08-018): Currently running (10/30/09 – 12/23/09):
    - Run is going OK, though noticeable down time; on the hall side mostly due to magnets trip/reset and on the accelerator side, mostly due to "normal" problems.
    - No complaints or grievances about the accelerator operation or lab/Hall management. The only minor issue is that the days on the floor are slightly less than what was approved by the PAC (this is due to scheduling issues).
    - The accelerator and the source group have done a good job supporting the experiment; Also good coordination with Hall B.

Hall B:
- Eg6-run; ongoing (Contributed by Stepan Stepanyan):
    - In general eg6 run is going well; running two A-rated experiments, E-07-009 and E-08-024.
    - For this run we designed and built a new RTPC based on cylindrical GEMs (similar to Bonus detector) for detection of alpha particles with momentum ~250MeV/c - 300MeV/c. The main reason for lost time at the beginning of the run was the commissioning of the new RTPC.

- Combination of schedule change for hypernuclear experiment in Hall C and delays in RTPC DAQ modifications cost additional week of commissioning (was planned to do it two weeks but spent three weeks)
- The only complaint is about the run schedule; started with 20% less time compared to the PAC approved production run time due to scheduling, now after above mentioned, down by ~30% from PAC approved production run time.
- Group would like to thank first accelerator talks for excellent work running two difficult experiment smoothly, also like to thank Hall B engineering group for setting up the experiment in a very short time, and we also thank the lab management for deciding to run over thanksgiving, it saved us at least a week.

Hall C

- HKS Experiment - E05-115 (Contributed by Osamu Hashimoto)
  - In summary the experiment successfully concluded, despite several major problems. Details are given below.
  - Just before the beam delivery to the Hall-C (21st Aug), the target system was broken due to jammed yellow tape wrapped around the water-pipe which was put by a person from RADCON who did not notice the water pipe system was movable. Thanks to quick work by Hall-C technicians, HKS-HES vacuum system was safely broken and the water pipe was changed.
  - At the first period of the beam tuning, unstable power supply for the DZ magnet (first steering dipole in the new HKS beam chicane) caused large beam jumping (easily visible on the BeO target). This prevented Hall-C from having CW beam. About a week was spent to diagnose the problem. Finally, the power supply of the DZ magnet was replaced by one for the HKS-Q2.
  - We expected the commissioning of the newly installed HKS pre-chicane beam line to be a difficult task, and it turned out to be much harder than we expected. Multiple problems caused a beam shift by an angle of 0.42 degrees; the beam position shift on the target was less than 1 mm, but the photon position on the dump was significantly changed. It meant that safe delivery of electrons and photons to dumps was impossible without changing the experimental conditions seriously. After discussions with accelerator division a solution was found with careful beam tuning by Mike Spata and Alex Bogacz. Finally the commissioning of the newly introduced HES spectrometer was seriously the 2nd of Sep.
  - Another major problem was failure of the water pump for the Hall-C dump on 26th Sep. Until replacement of the pump by a newly purchased one on 29th, Hall-C accepts only low current beam (<5uA), which we used for system check and the calibration data taking with the H2O target.
  - On 20th Oct and 27th Oct, JLab accelerator site suffered from two power outages. Recovery of the beam was extraordinarily quick (about 1.5 days), but some of the electronics was broken, and beam stability was slightly different. In order to return the experiment to stable data taking, a few days were needed.
  - We would like to thank all accelerator staff, Hall C technicians/engineers for making such a large installation possible overcoming the above difficulties.
  - We also want thank JLab management, Hugh Montgomery, Larry Cardman, Dennis Skopic and Hall leaders, Kees De Jager and Volker Burkert, and the Happex, EG6 collaborations for allowing us to extend the beam time and calibration runs with different beam energies.
  - Especially we thank Mike Spata who designed the pre-chicane beam line. He coordinated the close collaboration between accelerator group and the experiment group.
  - We thank Dave Meekins for design of the water cell target system and Lithium targets

preparation. We thank Steve Wood for DAQ setup and encouraging the collaboration as the Hall-C leader.

E05-115 (HKS-HES) spokespersons,

O.Hashimoto, S.N.Nakamura, L.Tang and J.Reinhold