MEMORANDUM

Date: June 11, 2003

To: Distribution

From: Larry Cardman and Andrew Hutton for the Nuclear Physics Experiment Scheduling Committee

Subject: Draft Accelerator Schedule: Through June 2004

Schedule

The draft accelerator operations schedule through June 2004 is now available on the web at the following url:

http://www.jlab.org/exp_prog/experiment_schedule/

The accelerator will operate for approximately 30 weeks during Fiscal Year 2004.

The Jefferson Lab Nuclear Physics Experiment Scheduling Committee developed the schedule. Committee members are: Larry Cardman and Andrew Hutton (Co-Chairmen), Hari Areti, Jay Benesch,Volker Burkert, Rolf Ent , Kees de Jager, Lia Merminga, Will Oren, Mike Seeley, Dennis Skopik, Steve Suhring, and Karen White. Rocco Schiavilla and Matt Poelker provided advice. As has been the norm, a number of meetings of this committee were necessary to resolve conflicting requirements and to ensure that sufficient resources would be available at the laboratory to properly stage and carry out each of the experiments. The schedule was derived by looking at the requests for major installation work in the experimental halls, evaluating the number and kinds of people needed, and then scheduling to minimize overlap. The schedule request forms were useful in identifying the detailed requirements of each experiment. Information on other laboratory engineering priorities was included to ensure that the required preparatory work could be completed in time. This provided a rough overview of when each hall would be down.

Each hall leader took the requests for running time submitted by the experiment spokespersons and prioritized them based on the PAC recommendations and other considerations as outlined in the scheduling committee charter. Because of the difficulties delivering c.w. beam this past year all Halls were scheduled using an overall efficiency of 50%. The final schedule was reached by a series of compromises in running order within each experiment and between halls to work around incompatibilities.

The standard section at the end of this memo on “the meaning of priority on the accelerator schedule” is included for reference; there were no changes in the policy this cycle other than a note (#4) added to the general schedule notes clarifying polarization delivery in the event an experiment not formally approved to use polarized beam requests it. All users with running experiments should read the basic memo and the new note carefully.

The schedule attached represents our best effort to optimize the physics output of the laboratory consistent with our resource constraints and the technical evolution of the accelerator and the experimental equipment. In the material that follows, we outline the technical considerations that influenced the scheduling, and outline the planned program.

Accelerator

At the beginning of FY03, the accelerator provided beam for G0's first engineering run in Hall C, using a commercial laser to generate the required beam structure. Sending 40 μA of average current to G0 with the tight beam specifications was challenging. By the end of the run, G0 received an average beam current of 40 μA for a few days. Some challenges still remain, viz., maintaining the beam current and controlling the helicity correlated effects while sending good quality beam to the other halls. In May 2003, we dedicated three days to beam studies to measure and reduce the momentum spread in Hall A with and without G0 conditions in the injector (no G0 beam). The measured momentum spread in Hall A was $3.3 * 10^{-5} \pm 3.2 * 10^{-6}$ under G0 beam conditions and $2.0 * 10^{-5} \pm 2.2 * 10^{-6}$, when optimized for Hall A beam under normal running conditions. This means that the accelerator can meet the momentum spread requirements for Hall A's hypernuclear experiment (E94-107), whose momentum spread requirement is $< 3.0 * 10^{-5}$. While it may not be impossible, meeting and maintaining the beam requirements for both G0 and the hypernuclear experiment simultaneously will be highly challenging, and will tax both the experimenters and the operations staff.

During FY03, there were three major configuration changes to the accelerator. The first change was to multiplex the Switched Electrode Electronics (SEE) of the Beam Position Monitors (BPM). Since the G0 beam contains peak currents that saturate the 'normal' four channel electronics used to obtain the beam position, the change-over to the SEE electronics was necessary. While this necessary change worked well during the G0 run, it reduced beam availability during the run starting in April 2003. This is because, for certain accelerator configurations (the number of passes and currents to the experimental halls), the multiplexed SEE BPMs can give incorrect information to the orbit lock software, causing that software to drive the beam off orbit. Having finally understood the problem, we are aggressively pursuing its solution.

The second configuration change was to use a new Beam Current Monitoring (BCM) system to protect from beam losses that could damage the accelerator. The new system can detect 300 nA of beam loss compared to the 2 μA sensitivity of the previous system. For a period of three months, both the new and old systems ran in parallel, with the old system providing the Machine Protection while we watched the new system's response. After the March 2003 down time, we disabled the old system and began using the new system.

The third configuration change was the installation of a new cryomodule in zone 21 of the south linac (SL21) of the accelerator. The new cryomodule consists of 7 cell cavities (as opposed to 5 cell cavities of the other cryomodules) and has a design capability of developing an accelerating gradient of 68 MV.

These three changes, necessary as they were, contributed to a significant loss in the accelerator's availability for physics; for the months of April and May 2003 the accelerator's availability was about 50%. We are pursuing solutions to obtain reliable reading from the multiplexed SEE BPMs. We are systematically investigating the reasons for the BCM systems causing some false trips. Some BCM trips, which are real, are due to the behavior of SL21 cryomodule. We are beginning to understand the operating parameters of this new cryomodule.

The accelerator division has commissioned a team of Performance Integrators, whose specific task is to improve the accelerator's availability by ensuring that individual systems as well as their interfaces to peer systems operate to specifications.

The polarized injector, with two fully operational, horizontally mounted polarized guns (one for production beam and one as a spare), continues to perform well, providing better than 75% beam polarization. Our studies indicate that the quantum efficiency of the photocathode (therefore the photocathode lifetime) deteriorates due to positive ion back bombardment of the cathode. By improving the gun vacuum, we are achieving excellent photocathode lifetimes. The current value provides over 300 Coulombs at high current. In addition, we are able to recover most of the quantum efficiency of the photocathode by a simple heat treatment and reactivation during a normal maintenance period. This implies that we can use a single photocathode for a very long time.

Although it is not on this schedule, there is another major capability upgrade on the horizon. The HAPPEX-II experiment will require unprecedented precision in helicity-correlated errors in energy, position, and current. We have launched a team, which includes experimenters as well as accelerator physicists, whose task is to provide parity quality beam for 'parity' experiments. The team's scope includes the injector, machine optics and the instrumentation to generate and maintain parity quality beam. Beam specifications as tight as HAPPEX-II's do reduce beam availability due to the large number of systems that have to work in concert.

Finally, we have made good progress in understanding the field maps of the quadrupoles in arc 3. This has improved our ability to tune the machine and maintain the beam delivery.

We will continue to reserve a 12 hour period every week in order to recover RF cavities and perform other limited beam development activities deemed critical to successful accelerator operations. We have been taking this time in 2-hour blocks during day shifts during weekdays. Taking these short periods, as opposed to longer periods spanning two shifts, has had the advantage of reducing the beam recovery time. In addition, these periods can coincide with short accesses by the halls, increasing the beam time available for physics.

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The DOE, through negotiations with JLab, defines the accelerator availability goal. The long-term availability goal is 80% at an experimental hall multiplicity of 2.0. Since we usually run at higher multiplicity, we have analyzed the running data for the last five years to evaluate the impact of multiple Hall operation on availability. The results show that the availability for single Hall operation should be 5% higher while the availability for three Hall operation should be 5% lower than the 80% goal. In addition, for many years there has been an understanding that the accelerator's availability for the first three months of commissioning a major capability upgrade will be 10% lower. Putting all this together with the proposed running schedule leads to an accelerator availability goal that varies through the year depending on the difficulty of the program.

Hall A

The experimental schedule had again to be readjusted several times to incorporate further delays in the delivery of the septum magnets. After the summer down E00-007 (proton polarization angular distribution in deuteron photodisintegration; Gilman and Holt) and E00-107 (Gilman) were scheduled to run. Due to a cryotarget crash only E00-007 could be completed. Following that E01-020 (exclusive electro-disintegration of the deuteron; Boeglin, Ulmer, et al.) was run to completion. In December the polarized ^{3}He target was installed in order to run E01-012 (a study of spin duality on the neutron; Liyanage, Chen, and Choi). Finally, in February of 2003 the first septum was delivered, installed and eventually cooled down. The coils initially could not be cooled down because of a design error in their cooling. A temporary fix was successful in resolving that issue. During commissioning of the septum it became clear that there also was a problem with the electrical connection of the coils. Nevertheless, part of E97-110 (the GDH sum rule on the neutron with nearly real photons; Garibaldi, Chen, and Deur) was completed before repairs were initiated on the septum magnet.

After the coils have been connected correctly, E97-110 will be run to completion in July/August. Then, with the second septum expected to be on site, the cooling problem of the first septum will be corrected and both septa installed, together with the waterfall target, in order to run E94-107 (a study of hypernuclear spectroscopy; Garibaldi, et al.) in December and January. Next, the septa will be removed and the BigBite spectrometer will be installed to run E01-015 (a study of the internal small distance scale of nuclei; Wood, Piasetzky, and Bertozzi) in April and May. Following that, the DVCS calorimeter and proton scintillator array will be installed.

Hall B

After the maintenance period in July/August 2002, the g7 experiment (search for medium modifications in the mass spectrum of electron-positron pairs) took data and was completed. This was followed by the beginning of the e1e run (polarized electrons on a hydrogen target, mainly to study N* excitations, 14 experiments). The e1e run is followed by the e1f and e1g runs, which will complete the presently approved e1 program. It will occupy the entire first half of 2003 and the first two months of the second half of 2003.

The remaining part of 2003 shows the schedule for a major portion of the eg2 run (high energy electrons on a variety of nuclear targets to study quark propagation and vector meson production in nuclei, experiments E02-104 and E02-110). The tentative schedule for the first half of 2004 shows the installation of the PrimEx (Precision Measurement of the π^0 decay width through the Primakoff effect) apparatus, followed by a brief commissioning period, and running of either g8b or another (yet to be specified) photon experiment. A major portion of PrimEx would run before the machine shutdown. The accelerator down period will be used for the installation of the DVCS experiment. PrimEx running should be completed immediately after the down period.

Hall C

At the release of the last schedule Hall C had just started the first engineering run for E00-006 (the G0 forward angle measurements; Beck). This first G0 engineering run extended thru January 2003, and ended with close to 100 hours of "dress rehearsal" data. At that time the Hall was reconfigured for a series of HMS and SOS base equipment experiments, all using 4 cm hydrogen and/or deuterium targets. Experiment E00-002 (Niculescu/Keppel) measured the F_2 structure function in the unmeasured low-Q^2 region. Experiment E01-002 (Frolov/Koubarovky/Stoler) was a higher Q^2 extensions of the N-Δ transition form factor experiments. Lastly, experiment E00-116 (Keppel) is a small experiment finalizing Hall C's quark-hadron duality studies at the highest Q^2 achievable at a 6-GeV JLab.

The fixed schedule for the next 6 months starts with Experiment E01-004 (Blok, Huber, Mack), a higher Q^2 extension of the pion form factor measurements. This is followed by Experiment E00-108 (Ent/Mkrtchyan/Niculescu) that addresses quark-hadron duality in meson electroproduction. After this experiment the Hall will be reconfigured for the second engineering run of the E00-006 (Beck) "G0" experiment, until early December. At that time the Hall will, due to scheduling incompatibilities between Hall A's hypernuclear run and the G0 experiment, go into a period of maintenance. The tentative part of the Hall C schedule shows a continuation of this maintenance period followed by the forward angle measurements of the E00-006 (Beck) "G0" experiment. Mid-April the hall will be reconfigured to remove G0 from the beam line and prepare for the next series of experiments, either the Japanese-led Hypernuclear Kaon Spectrometer experiment or a series of base equipment HMS/SOS experiments using nuclear targets. The exact choice depends on compatibility with the other Halls' schedules and the availability of 6 GeV beam.

Information about the Schedule

The accompanying revised schedule is fixed through December 2003, and tentative for the following six months.. The firm schedule for the first half of 2004 (and the tentative schedule for the second half of 2004) will be released following the scheduling committee's next cycle of meetings.

Footnotes to the Schedule

We summarize here the detailed footnotes to the schedule. They appear in the rightmost column of the schedule listing, and are listed at the earliest date in the schedule when they are applicable; many extend for a considerable time after they first appear. The first five footnotes apply to the entire schedule. All of the footnotes are repeated here for clarity and information.

1. When two or three halls are scheduled, the relative priority listed in the schedule (in the order listed from left to right) is the relative priority of the halls. For example, A/B/C means that Hall A is the highest priority, Hall B has second priority, and Hall C has the lowest priority. If one of the halls has an asterisk, it means that its priority is conditional, and the conditions are given in appropriate footnotes at the beginning of the running of the affected experiment. If the conditions are not met, then the remaining two halls will have priority in the order listed.

2. Energies listed in the schedule for the halls receiving polarized beam are the actual, delivered energies; they include the energy of the injector.

3. When polarized beam is delivered to all three halls, it is not, in general, possible to provide pure longitudinal polarization to all users. We have optimized the beam energies to provide the highest longitudinal polarization (generally over 90%) to all halls during extended periods of scheduled two- and three-hall operation with polarization. For two-hall operation we have occasionally used less than ideal linac energy settings when one or more of the halls has a scheduled pass change in order to optimize polarization delivery over the entire run. This avoids the loss of beamtime associated with a linac energy change, and it avoids energy shifts in the hall that has no interest in changing energy at the time of the transition in the other hall. See the note in the "polarization" subsection of the text on the meaning of priority in the schedule; the note is attached below.

4. In all cases, the orientation of the polarization at the injector will be optimized by setting the Wien angle to a value that minimizes the differences between the hall polarizations (by minimizing the dispersion) so long as this scheme does not result in a reduction of the "sum of squares" figure of merit by more than 2% compared to the optimum figure of merit as determined by summing the squares of the polarization provided to all halls scheduled to receive polarized beam. If minimizing the dispersion results in a loss of more than 2% relative to the optimum figure of merit, we will revert to our earlier algorithm of setting the Wien filter to maximize the overall figure of merit.

   If polarized beam is requested by a Hall for an experiment that was not explicitly approved for running with polarized beam, every effort shall be made to accommodate that request. However, the figure of merit for running polarized beam for approved experiments in the other Halls must not be affected significantly. In all cases involving polarized beam delivery the setting of the Wien Filter shall be fixed throughout the running period unless all parties scheduled to receive polarized beam agree to a different setting.

5. When polarized beam is provided at a new energy, as much time as necessary during the first shift of polarized beam operation will be used to verify polarization in the halls. This can be done by direct polarimetry in the hall(s) and/or by taking data on a reaction that is adequately sensitive to the beam polarization. By the end of the first shift of production running with polarized beam, the run coordinator(s) for any experiment(s) receiving polarized beam must report to the Program Deputy that they have measured the beam polarization and determined it to be acceptable. Otherwise, a measurement of the beam polarization will be scheduled immediately. When the polarized beam energy is being changed in only one hall (e.g. a "pass change") then that hall should measure beam polarization by the end of the first shift of production running. Further, if the change in settings of the Wien filter are substantial, all

three halls should measure and report beam polarization by the end of the first shift of production running with the new setup.

6. Due to the ongoing uncertainties with the septa magnets in Hall A, Hall A is not listed on the firm part of the schedule until December 2003 when we hope to begin the Hypernuclear experiment. When repairs have been completed on the initial septum and it has been conditioned and successfully field mapped, Hall A will resume the GDH experiment(E97-110). This experiment will use beam conditions that are compatible with those on the schedule for Hall B and Hall C.

7. The G0 engineering run is scheduled to be completed December 1, 2003. G0 has been placed on the tentative schedule beginning in mid-February; dependent upon the collaboration demonstrating that the experiment is ready to begin production running. This run cycle will complete the forward angle PAC approved days.

Additional General Information on Operations and Scheduling Constraints

The accompanying schedule is fixed for the seven-month period June 2003 thru December 2003 and tentative for the following six months. Priorities have been assigned as "firm" for the period of the schedule that is fixed; the tentative priorities set for the January-June 2004 period will be reviewed when the schedule for that period becomes fixed. As noted earlier in this memo, the operation of polarized beams in more than one hall puts severe constraints on our ability to change beam energies.

The Meaning of Priority on the Accelerator Schedule

Generally, the assignment of priority to a hall means that the identified hall will have the primary voice in decisions on beam quality and/or changes in operating conditions. We will do our best to deliver the beam conditions identified in the schedule for the priority hall. It will not, however, mean that the priority hall can demand changes in beam energy that would affect planned running in the other halls without the consent of the other halls. Of course, final authority for decisions about unplanned changes in machine operation will rest with the laboratory management.

The operation of more than one hall at Jefferson Lab substantively complicates the interaction between the experimenters and the accelerator operations group. It is in the interests of the entire physics community that the laboratory be as productive as possible. Therefore, we require that the run coordinators for all operating halls do their best to respond flexibly to the needs of experiments running in other halls. The run coordinators for all experiments either receiving beam or scheduled to receive beam that day should meet with the Program Deputy at 7:45 AM in the MCC on weekdays, 8:30 AM on weekends.

To provide some guidance and order to the process of resolving the differing requirements of the running halls, we have assigned a "priority hall" for each day beam delivery has been scheduled. We outline here the meaning of priority and its effect on accelerator operations.

The priority hall has the right to:

- require a re-tune of the accelerator to take place immediately when beam quality is not acceptable

- insist that energy changes occur as scheduled
- obtain hall access as desired
- Request beam delivery interruptions for experiment-related operations such as Mott measurements of the beam polarization or pulsed operation for current monitor calibrations, temporarily blocking normal beam delivery to all halls. These interruptions shall be limited by a sum rule - the total time lost to the non-priority hall(s) due to such requests shall not exceed 2.5 hours in any 24-hour period. It is, of course, highly preferred that these measurements be scheduled at the morning meeting of the run coordinators whenever possible, and coordinated between halls whenever possible.

When the priority hall has requested a re-tune, if the re-tune degrades a previously acceptable beam for one of the other, lower priority running halls, then the re-tune shall continue until the beam is acceptable to both the priority hall and the other running halls that had acceptable beam at the time the re-tune began.

Non-priority halls can:

- require that a retune of the accelerator take place within 2.5 hours of the desired time (it will nominally occur at the earliest convenient break in the priority hall's schedule)
- require access to the hall within 1 hour of the desired time (again, it will nominally occur at the earliest convenient break in the priority hall's schedule)
- request Mott measurements in the injector within 2.5 hours of the desired time (it is preferred that this be scheduled at the morning meeting of the run coordinators and coordinated between the running halls whenever possible).

The ability of non-priority halls to request retunes and accesses shall be limited by a sum rule - the total time lost to the priority hall due to such requests shall not exceed 2.5 hours in any 24-hour period. (To facilitate more extended tuning associated with complex beam delivery, with the agreement of the run coordinators for all operating halls, the sum rule may be applied over a period as long as three days, so long as the average impact is less than 2.5 hours/day.) In the event that two non-priority halls are running, the 2.5 hours shall be split evenly between them in the absence of mutual agreement on a different split.

During operations in which a single, 1500 MHz laser is being used to drive the electron source for all 3 halls, when a non-priority hall needs changes to the accelerator state (re-tuning, access, etc.), then all halls currently receiving beam need to agree on the timing of the change, and the shift leader for the priority hall should contact the crew chief to make the formal request. The upgrades to the PSS and MPS system, together with the development of the three-laser drive system eliminate the need for this constraint during 3-laser operation of the source. However, it is necessary to reinstate this constraint whenever, for reasons of source performance in service to the running experiments, a single drive laser is used. It is also necessary to reinstate the constraint on a temporary basis in situations such as a laser failure in which we are forced to operate the polarized source in a non-standard manner.)

All Halls:

- can negotiate with other halls, and with the Accelerator and Physics Division for changes in scheduled energy changes (either direction)

Initial Tune-up of New Beams:

- Normally one shift is set aside for tune-up whenever a new beam setup is being tuned (for unusual beam setups more time may be scheduled explicitly for tuning at the discretion of the scheduling committee). It is understood that beam tune-ups shall *always* be done in the order that the accelerator operations group believes will minimize the *total* time needed to tune *all* scheduled beams (i.e., the "priority hall" beam is not necessarily tuned first). In the event that obtaining the new beam setup requires more than the scheduled time, the Accelerator Program Deputy is authorized to spend up to one additional shift of tuning in an effort to deliver all scheduled beams instead of just the "priority hall" beam.

Polarization:

- Note that the setting of the Wien filter, which determines the polarization orientation in all halls, is NOT affected by the hall priority assignment. For two-hall operation we will always optimize the figure of merit for the two running experiments by setting the Wien filter to a value that results in identical longitudinal polarization components for the two halls. For three-hall operation we set the Wien angle to a value that minimizes the differences between the hall polarizations (by minimizing the dispersion) so long as this scheme does not result in a reduction of the "sum of squares" figure-of-merit by more than 2% compared to the optimum figure of merit as determined by summing the squares of the polarization provided to all halls scheduled to receive polarized beam. If minimizing the dispersion results in a loss of more than 2% relative to the optimum figure of merit, we will revert to our earlier algorithm of setting the Wien filter to maximize the overall figure of merit. In all cases involving polarized beam delivery the setting of the Wien Filter shall be fixed throughout the running period unless all parties scheduled to receive polarized beam agree to a different setting.

Finally, any change in the accelerator schedule that has implications for running beyond one week and/or is not agreed to by the run coordinators for all affected experiments and the accelerator program deputy must be discussed and confirmed at meetings to be held (as required) each Tuesday and Friday afternoon at 4:00 in the office of the AD for Physics.

Maintenance/Development

The maintenance cycle that was started last year has proven to be a considerable improvement. In the present running cycle we will continue to extend the time between full (12 shift) maintenance periods. During a typical 4-week cycle period the maintenance/development cycle remains the same, but we will take the reserved 12 hours/week in 2-4 hour blocks during weekdays. This cycle offers improved opportunity for accelerator and injector related maintenance, and should result in even higher availability for physics.

Holidays

For holidays shown on the schedule the beam will be shut down at ~noon on the last day shown as beam delivery.

Energy Constraints on Multiple Hall Operations

The standard constraints for the different energies in the three halls during multiple hall operation are reiterated here for your information. The RF separators are able to extract one beam after each pass or, alternatively, to deliver beam to all three halls after five passes.

Therefore, it is always the case that:

1. All three beams can have the same energy only on the fifth pass.
2. No two halls can have the same energy, except on the fifth pass.
3. Unusual beam energies in one hall will sometimes preclude multiple beam operation and impose shutdowns on the other halls, unless one or more of the other halls can also use a commensurate, unusual energy.

Polarization Constraints on Multiple-Hall Operations

There are only two beam energies (2.115 and 4.230 GeV) at which purely longitudinal spin can be delivered simultaneously to all three halls when the halls have the same energy. There are, however, many combinations of passes and linac energies at which it is possible to deliver beams with precisely longitudinal polarization to two halls simultaneously, and many combinations at which it is possible to deliver nearly longitudinal polarization to three halls. A technical note covering all combinations of 2-hall polarized beam running is available (TN 97-021). Tables of ideal energies for two-hall operation and optimal energies for three-hall operation are available at the url: http://clasweb .jlab.org/spin_rotation/

You can also determine the dependence of the polarization in all three halls on the Wien filter angle for the actual settings of the accelerator. Experimenters scheduled for periods involving multiple-hall polarized beam delivery should consider the possible impact of a transverse polarization component on their measurements, and provide the laboratory with a maximum allowable transverse component if appropriate. Because of the limitations on beam energies associated with the different combinations of linac settings and numbers of passes delivered to the different halls, we have a great deal less flexibility for changing energies in the different halls during polarized beam running. This is because there are many instances where the nominal linac energy and number of recirculations for the running halls provide reasonable polarization, but where changing the number of recirculations for one of the running halls results in nearly transverse polarization.

In an effort to optimize polarized beam running, we schedule many weeks of operation at energies that are consistent with good polarization in multiple halls. The details vary from run period to run period and hall by hall. In the worst case, the effective polarization delivered to a hall is typically reduced to no less than ~90% of the nominal maximum available from the cathode. This reduction is due to the angle at which the polarization vector will be set relative to the beam direction in the hall in a compromise that will optimize delivery to all halls. For two-hall operation we can optimize the figure of merit for both running experiments by simply setting the Wien filter to a value that results in identical longitudinal polarization components for the two halls. For three-hall operation we have previously used an algorithm that set the Wien filter to a value that maximized the overall figure of merit (the sum of the squares of the polarization provided to all halls scheduled to receive polarized beam). It has been noted that this sometimes results in situations where the delivered polarization is significantly different for the three halls. To "equalize the pain" for three-hall operation, we are adopting a refinement to this algorithm. The Wien angle for three-hall operation will now be set to minimize the differences between the hall polarizations (by minimizing the dispersion) *so long as this scheme does not result in a reduction of the "sum of squares" figure of merit by more than 2% compared to the optimum figure of merit.* In all cases involving polarized beam delivery the setting of the Wien Filter shall be fixed throughout the running period unless all parties scheduled to receive polarized beam agree to a different setting.