

## **Accelerator Physics Video Conference Minutes, 11/7/00**

Participants: J. Wei, Y. Pappaphilipou, H. Hseuh, S. Kim, S. Cousineau, S. Alexandrov, S. Danilov, P. Chu, D. Jeon, J. Stovall, A. Ratti, T. Shea, N. Malitsky, SY Zhang, S. Kurennoy, J. Staples, R. Connelly, B. Shafer

### **1) Post DOE Review Discussion & Plan**

Jei talked about two current reviews taking place this week: A Pre-Op review, and a Cost & Scope review. In lieu of recent budget concerns, management is considering lowering the beam power to 1 MW. There are two schemes for doing this:

a) Keep the same baseline energy, but reduce the intensity and use 2 cavities-per-klystron.

b) Lower the cryomodule energy, making the beam energy 800-840 MeV, but leave the linac tunnel in tact. The beam intensity in the ring would be reduced by about a factor of 1.6, achieved by a combination of reduced duty cycle (and injection period), and lower peak current.

The second option is presently the more favored (ASD/AP) plan, as it would allow for ease in later upgrades. Also, there is talk of slashing R&D projects, including e-p instability and collimation studies. Sextuple options for the ring have already been cut, and planned manpower may be reduced by a factor of 1/3. Presently, however, no decisions have been finalized.

### **2) Summary of MEBT Diagnostic Review**

Alex Ratti gave a summary of the MEBT diagnostics review. Comments indicate that the review went well and there were no major criticisms. There were 3 action items, including: 1) BNL and LBNL should agree on space allocation and beam box design, 2) a simple integrated schedule needs to be produced, and 3) the BPM feed through issue should receive a separate mini-review. Upon completion of the action items, construction of MEBT diagnostics may proceed as planned. Tom Shea is organizing a project-wide diagnostics review for Dec. 14-15 at LANL.

### **3) Ring IPM Performance Concern**

Sasha and Roger discussed Ring Ionization Profile Monitor IPM performance concerns. The concern is on the high sweeping voltage required to extract electrons that must overcome the proton beam potential. It was agreed that the correct sweep voltage for electron removal should be 30 kV between plates. Further discussions will proceed off-line.

### **4) HEBT Collimator Location Issue**

Jei discussed concerns about the relative location of the HEBT collimators and the tunnel access into the HEBT. Right now, the tunnel is located just 5 meters downstream from the collimators, and although beam residual radiation for this location has not yet been predicted, but collimator activation calculations indicate that levels in this area will be too high for human access (5 rem/h for 0.1% beam loss, with fixed and movable shielding). The collimators cannot be moved further downstream and can be moved upstream for at most 10 meters (Deepak said 1/2 cell length or 4 m, but maybe diagnostics

boxes can be swapped downstream and one move 1 -- 1 1/2 cell). As of yet there is no proposed solution to this problem. The question is whether cryomodules can still be moved in/out of the tunnel after initial operation, or if they should be moved through the front end of the tunnel. The plan must be stated explicitly. Bob Schafer also expressed concern about beam-on activation at the doors.

#### **5) SCL/HEBT Common Quad Possibility**

Linac/HEBT common quadrupole possibility. Since Deepak was not present, the issue was unclear. Jei thought that the HEBT design was largely unchanged from the days of warm linac. Around that time, the HEBT cell length was much longer than the CCL cell length (to save HEBT cost), and also beta functions/beam size. So the optics was very different. Deepak attempted to use common quad across HEBT, which means the same aperture (12 cm) in both arc (dispersive) and straight sections, hence a larger bore size. (The stripping was on 5-sigma amplitude halo being less than  $1.e-8/m$ ? not an issue).

Now the situation with SCL is different and cell length almost the same (within 0.1 m?), aside one doublet and the other FODO. It may be worthwhile to re-visit. The issue is on the cost -- the HEBT is all designed and probably partly procured (CE, vacuum pipe, magnets)? But how much one can save on power supply if we use linac bore/pipe? Discussion was deferred until Deepak's return.

#### **6) Ring Extraction Kicker Study**

Sergey discussed his MAFIA simulations of YY Lee's proposed extraction kicker magnet. Simulations predict that the impedance of the kicker is indeed reduced by an order of magnitude, as predicted, but that field strength is also reduced by a factor of 4. YY is relayed his concerns through Jei that the kicker in the simulation is not quite comparable to his design, and the simulation should be adjust to reflect the exact design. Sergey agreed to redo the simulation with any specifications that YY will give him when he returns from his trip. In addition, Slava has a few ideas of how it might be possible to lower the kicker impedance without compromising the field strength. Discussions will continue during the next video meeting.

#### **7) Ring Bellow Shielding**

H. Hseuh discussed the possibilities of ring bellow shielding to prevent e-p instability. He concluded that it was not a practical option because of space limitations. The impedance levels should not be a concern (SY et al.), but Slava and Mike estimate an increase of 20% in secondary emission, and therefore advise the installation of e-detector equipment near the bellows. However, available space is an issue. Slava/Yannis/Shasha will conclude further discussions off-line, and right now the baseline will be for no bellow shielding.

#### **8) Tech Note System**

Jei talked about the newly established SNS/AP tech note system, intended to centralize all AP work for future reference. It is informal but with certain level of control (at least 2 non-authors consider the work worth being a note). The note can share number with partner labs and it will be on the web open. We encourage all useful, AP-relevant work to be documented at this

place and John Galambos (web)/Jackie Smith (hard copy) are the managers. You are also encouraged to send in already published notes to this system if you consider it significant/updated.

#### **9) Additional Comments**

The first note, SNS/AP-1, is now out, authored by W. Wan et al on SNS global coordinates. The web address for this note is:

<http://www.sns.gov/APGroup/Papers/TechNotes/TechNotes.html>

Because of the upcoming Thanksgiving break, the next meeting will be scheduled  
Nov. 28.